PROFESSIONAL DIGITAL TWO-WAY RADIOS

# MOTOTRBO™ XiR™ M6660 ALPHANUMERIC DISPLAY MOBILE

# DETAILED SERVICE MANUAL

# Foreword

This manual covers all XiR™ M6660 Mobiles, unless otherwise specified. This manual provides sufficient information to enable qualified service technicians to troubleshoot and repair XiR™ M6660 Mobiles to the component level.

For details on radio operation or basic troubleshooting, refer to the applicable manuals available separately.

| | |
|---|---|
| Caution | **These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.** |

## Product Safety and RF Exposure Compliance

**ATTENTION!**

**Before using the mobile two-way product, XiR™ M6660, read the RF Energy Exposure and Safety guide that ships with the radio which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable Standards and Regulations.**

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# Notes

# Document History

The following major changes have been implemented in this manual since the previous edition:

| Edition | Description | Date |
|---|---|---|
| 68012008049-A | Initial Release. | June 2013 |

# Notes

# Warranty and Service Support

Motorola offers long term support for its products. This support includes full exchange and/or repair of the product during the warranty period, and service/ repair or spare parts support out of warranty.

| | |
|---|---|
| XiR M6660 Digital Mobile Radios | Two (2) Years |
| Product Accessories | One (1) Year |

## Warranty Period and Return Instructions

The terms and conditions of warranty are defined fully in the Motorola Dealer or Distributor or Reseller contract. These conditions may change from time to time and the following notes are for guidance purposes only. In instances where the product is covered under a "return for replacement" or "return for repair" warranty, a check of the product should be performed prior to shipping the unit back to Motorola. This is to ensure that the product has been correctly programmed or has not been subjected to damage outside the terms of the warranty.

Prior to shipping any radio back to the appropriate Motorola warranty depot, please contact Customer Resources or your Motorola dealer, distributor or reseller. All returns must be accompanied by a Warranty Claim Form, available from your Customer Service representative or Motorola Online Extranet (MOL) or your Motorola dealer, distributor or reseller. Products should be shipped back in the original packaging, or correctly packaged to ensure no damage occurs in transit.

### After Warranty Period

After the Warranty period, Motorola continues to support its products in two ways.

1. Motorola's Managed Technical Services (MTS) offers a repair service to both end users and dealers at competitive prices.
2. MTS supplies individual parts and modules that can be purchased by dealers who are technically capable of performing fault analysis and repair.

# Notes

# XiR™ M6660 Mobile Radios

## Detailed Service Manual

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June, 2013

# Notes

# Summary of Printed Circuit Boards and Bands available:

Table below lists all the bands available in this manual and the revision of the Printed Circuit Boards used. For details, please refer to the respective chapters.

| Chapter | Description | PC Board Part Number | Board Revision |
|---|---|---|---|
| 3 | Numeric Display Control Head | 84012531002 | B |
| 3 | Alphanumeric Display Control Head | 84012531002 | B |
| 4 | Generic Option Board (GOB) | 84012198001 | A |
| 6 | VHF Low Power 136–174 MHz, 1–25 W | 84012504002 | B |
| 7 | VHF High Power 136–174 MHz, 25–45 W | 84012505002 | B |

# Notes

# XiR™ M6660 Mobile Radios

## Chapter 1

## Service Maintainability

Issue: June, 2013

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# Chapter 1 – Service Maintainability

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# Notes

# Section 1

# INTRODUCTION

## 1.0 Notations Used in This Manual

Throughout the text in this publication, you will notice the use of note and caution notations. These notations are used to emphasize that safety hazards exist, and due care must be taken and observed.

**NOTE:** An operational procedure, practice, or condition that is essential to emphasize.

**Caution**

CAUTION indicates a potentially hazardous situation which, if not avoided, **might** result in equipment damage.

## 2.0 Radio Description

The XiR M6660 mobile radios are available in the following frequency ranges and power levels.

*Table 1-1 Radio Frequency Ranges and Power Levels*

| Freq. Band | Bandwidth | Power Level |
|---|---|---|
| VHF | 136–174 MHz | 1–25 Watts<br>25–45 Watts |
| UHF B1 | 403–470 MHz | 1–25 Watts<br>25–40 Watts |

These radios are among the most sophisticated two-way radios available. They have a robust design for radio users who need high performance, quality, and reliability in their daily communications. This architecture provides the capability of supporting a multitude of legacy and advanced features resulting in a more cost-effective two-way radio communications solution.

# Notes

# Section 2

# MAINTENANCE

## 1.0 Introduction

This chapter provides details about the following:

- Preventive maintenance (inspection and cleaning)
- Safe handling of CMOS and LDMOS devices
- Repair procedures and techniques
- Pre-baking of Integrated Circuits

## 2.0 Preventive Maintenance

Periodic visual inspection and cleaning is recommended.

### 2.1 Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. It is not recommended to inspect the interior electronic circuitry.

### 2.2 Cleaning Procedures

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the control head and housing assembly. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

**NOTE:** Internal surfaces should be cleaned only when the radio is disassembled for service or repair.

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is isopropyl alcohol (100% by volume).

| | |
|---|---|
| **Caution** | Use all chemicals as prescribed by the manufacturer. Be sure to follow all safety precautions as defined on the label or material safety data sheet.<br><br>The effects of certain chemicals and their vapors can have harmful results on certain plastics. Avoid using aerosol sprays, tuner cleaners and other chemicals. |

### Cleaning External Plastic Surfaces

Apply the 0.5% detergent-water solution sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. Use a soft, absorbent, lintless cloth or tissue to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.

### Cleaning Internal Circuit Boards and Components

Isopropyl alcohol (100%) may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The brush stroke should direct the dislodged material out and away from the inside of the radio. Make sure that controls or tunable components are not soaked with alcohol. Do not use high-pressure air to hasten the drying process since this could cause the liquid to collect in unwanted places. Once the cleaning process is complete, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, control head and housing assembly.

**NOTE:** Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).

## 3.0 Safe Handling of CMOS and LDMOS Devices

Complementary Metal Oxide Semiconductor (CMOS) and Laterally Diffused Metal Oxide Semiconductor (LDMOS) devices are used in this family of radios, and are susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during disassembly, troubleshooting, and repair.

Handling precautions are mandatory for CMOS/LDMOS circuits and are especially important in low humidity conditions.

DO NOT attempt to disassemble the radio without first referring to the following CAUTION statement.

**Caution**

**This radio contains static-sensitive devices. Do not open the radio unless you are properly grounded. Take the following precautions when working on this unit:**

- Store and transport all CMOS/LDMOS devices in conductive material so that all exposed leads are shorted together. Do not insert CMOS/LDMOS devices into conventional plastic “snow” trays used for storage and transportation of other semiconductor devices.
- Ground the working surface of the service bench to protect the CMOS/LDMOS device. We recommend using a wrist strap, two ground cords, a table mat, a floor mat, ESD shoes, and an ESD chair.
- Wear a conductive wrist strap in series with a 100k resistor to ground. (Replacement wrist straps that connect to the bench top covering are Motorola part number 4280385A59).
- Do not wear nylon clothing while handling CMOS/LDMOS devices.
- Do not insert or remove CMOS/LDMOS devices with power applied. Check all power supplies used for testing CMOS/LDMOS devices to be certain that there are no voltage transients present.
- When straightening CMOS/LDMOS pins, provide ground straps for the apparatus used.
- When soldering, use a grounded soldering iron.
- If at all possible, handle CMOS/LDMOS devices by the package and not by the leads. Prior to touching the unit, touch an electrical ground to remove any static charge that you may have accumulated. The package and substrate may be electrically common. If so, the reaction of a discharge to the case would cause the same damage as touching the leads.

# 4.0 Repair Procedures and Techniques – General

**NOTE** Environmentally Preferred Products (EPP) (refer to the marking on the printed circuit boards – examples shown below) were developed and assembled using environmentally preferred components and solder assembly techniques to comply with the European Union's **Restriction of Hazardous Substances (ROHS 2) Directive 2011/65/EU** and **Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU**. To maintain product compliance and reliability, use only the Motorola specified parts in this manual.

Any rework or repair on Environmentally Preferred Products must be done using the appropriate lead-free solder wire and lead-free solder paste as stated in the following table:

*Table 2-1 Lead Free Solder Wire Part Number List*

| Motorola Part Number | Alloy | Flux Type | Flux Content by Weight | Melting Point | Supplier Part number | Diameter | Weight |
|---|---|---|---|---|---|---|---|
| 1088929Y01 | 95.5Sn/3.8Ag/0.7Cu | RMA Version | 2.7–3.2% | 217°C | 52171 | 0.015" | 1lb spool |

*Table 2-2 Lead Free Solder Paste Part Number List*

| Motorola Part Number | Manufacturer Part Number | Viscosity | Type | Composition & Percent Metal | Liquid Temperature |
|---|---|---|---|---|---|
| 1085674C03 | NC-SMQ230 | 900–1000KCPs Brookfield (5rpm) | Type 3 (-325/+500) | (95.5%Sn–3.8%Ag–0.7%Cu) 89.3% | 217°C |

**Parts Replacement and Substitution**

Check the parts list for the proper Motorola part number and order the part from the nearest Motorola Radio Products and Solutions Organization listed in Appendix A of this manual.

**Rigid Circuit Boards**

This family of radios uses bonded, multi-layer, printed circuit boards. Since the inner layers are not accessible, some special considerations are required when soldering and unsoldering components. The printed through holes may interconnect multiple layers of the printed circuit. Therefore, exercise care to avoid pulling the plated circuit out of the hole.

When soldering near a connector:

- Avoid accidentally getting solder in the connector
- Be careful not to form solder bridges between the connector pins
- Examine your work closely for shorts due to solder bridges

For soldering components with Hot-Air or infra red solder systems, please check your user guide of the solder system to get information on solder temperature and time for the different housings of the integrated circuits and other components.

# 5.0 Pre-baking of Integrated Circuits

Electronic components are generally coated with plastic material which has the nature of not being waterproof. If kept unsealed, the components can absorb humidity. When soldered to the board (especially with reflow techniques) a sudden change in temperature can cause fissures or cracks which can result in malfunction or damage. Therefore, service should temper in a Desiccant Cabinet (12 hours at 50 degree Celsius) the radio PCB, before heating up areas around MS components.

To avoid this problem, these Moisture Sensitive (MS) components should be stored and shipped in a sealed wrapping (dry pack). Processing must take place only with dry components when an uninterrupted dry storage can be guaranteed, otherwise the components have to be pre-baked.

If a reflow procedure takes place close to MS components the whole board must be pre-baked.

Please refer to the following table:

*Table 2-3 MS Components and Location*

| Location | Circuit Ref. | Motorola Part No. | MSL |
|---|---|---|---|
| Alphanumeric Display Control Head | D6005<br>D6006<br>D6008<br>D6009<br>D6011<br>D6012<br>D6013<br>D6014 | 48012219001 | 2 |
| Alphanumeric Display Control Head | D6004 | 48012255001 | 2 |
| Alphanumeric Display Control Head | D6002 | 4805729G73 | 2A |
| Alphanumeric Display Control Head | D6001 | 4805729G74 | 2A |
| Alphanumeric Display Control Head | D6000 | 4805729G75 | 2A |
| Controller R1 | U2001M1 | 51012031001 | 3 |
| Controller R1 | U2001M1 | 51012058002 | 3 |
| Controller R1 | U3103M1 | 51012142001 | 2 |
| Controller R1 | U2000M1 | 51012239002 | 3 |
| Controller R1 | U3200M1 | 51012469001 | 2 |
| Controller R1 | U1001M1 | 51012487001 | 3 |
| Controller R1 | U3104M1<br>U3105M1 | 5114610F01 | 2 |
| VHF 25–45 W | Q0702M6 | 48012022001 | 3 |
| UHF1 25–40 W | Q0705M6 | | |
| VHF 1–25 W | Q0702M5 | 48012067002 | 3 |
| UHF1 1–25 W | Q0705M5 | | |
| VHF 1–25 W<br>VHF 25–45 W<br>UHF1 1–25 W<br>UHF1 25–40 W | Q0402M4 | 48012201001 | 2 |

*Table 2-3 MS Components and Location (Continued)*

| Location | Circuit Ref. | Motorola Part No. | MSL |
|---|---|---|---|
| VHF 1–25 W<br>VHF 25–45 W<br>UHF1 1–25 W<br>UHF1 25–40 W | VR0201M7<br>VR0400M4<br>VR0401M4<br>VR0402M4<br>VR0403M4 | 4805656W87 | 2 |
| VHF 1–25 W<br>VHF 25–45 W | VR0205M7<br>VR0210M7<br>VR0211M7<br>VR0214M7<br>VR0215M7 | | |
| UHF1 1–25 W<br>UHF1 25–40 W | VR0200M7<br>VR0202M7<br>VR0203M7<br>VR0250M7<br>VR0251M7<br>VR0252M7<br>VR0253M7 | | |
| VHF 1–25 W<br>VHF 25–45 W<br>UHF1 1–25 W<br>UHF1 25–40 W | D0401M4<br>D0402M4 | 4813974A19 | 2 |
| VHF 1–25 W<br>UHF1 1–25 W | Q0700M5 | 4816547H01 | 2 |
| VHF 25–45 W<br>UHF1 25–40 W | Q0700M6 | | |
| VHF 1–25 W | Q0704M5 | 4816548H01 | 3 |
| UHF1 1–25 W | Q0702M5 | | |
| VHF 25–45 W<br>UHF1 25–40 W | Q0704M6 | | |
| VHF 1–25 W<br>VHF 25–45 W<br>UHF1 1–25 W<br>UHF1 25–40 W | U0000M2 | 51009686002 | 3 |
| VHF 1–25 W<br>UHF1 1–25 W | U0903M5 | 5115022H01 | 3 |
| VHF 25–45 W | U0904M6 | | |
| UHF1 25–40 W | U0903M6 | | |
| VHF 1–25 W<br>VHF 25–45 W | U200M7 | 5186310Y39 | 2 |
| VHF 1–25 W<br>VHF 25–45 W<br>UHF1 1–25 W<br>UHF1 25–40 W | U0401M4<br>U0402M4 | | |
| UHF1 1–25 W<br>UHF1 25–40 W | U0350M7 | | |

## 5.1 IPC/JEDEC J-STD-020D.1 (March 2008) Chart

*Table 2-4 Moisture Sensitivity Levels*

| LEVEL | FLOOR LIFE | | SOAK REQUIREMENTS | | | | |
|---|---|---|---|---|---|---|---|
| | | | STANDARD | | ACCELERATED EQUIVALENT[1] | | |
| | | | | | eV 0.40–0.48 | eV 0.30–0.39 | |
| | TIME (hours) | CONDITION | TIME (hours) | CONDITION | TIME (hours) | TIME (hours) | CONDITION |
| 1 | Unlimited | ≤30 °C/85% RH | 168 +5/-0 | 85 °C/85% RH | NA | NA | NA |
| 2 | 1 year | ≤30 °C/60% RH | 168 +5/-0 | 85 °C/60% RH | NA | NA | NA |
| 2a | 4 weeks | ≤30 °C/60% RH | 696[2] +5/-0 | 30 °C/60% RH | 120 +1/-0 | 168 +1/-0 | 60 °C/60% RH |
| 3 | 168 hours | ≤30 °C/60% RH | 192[2] +5/-0 | 30 °C/60% RH | 40 +1/-0 | 52 +1/-0 | 60 °C/60% RH |
| 4 | 72 hours | ≤30 °C/60% RH | 96[2] +2/-0 | 30 °C/60% RH | 20 +5/-0 | 24 +0.5/-0 | 60 °C/60% RH |
| 5 | 48 hours | ≤30 °C/60% RH | 72[2] +2/-0 | 30 °C/60% RH | 15 +5/-0 | 20 +0.5/-0 | 60 °C/60% RH |
| 5a | 24 hours | ≤30 °C/60% RH | 48[2] +2/-0 | 30 °C/60% RH | 10 +0.5/-0 | 13 +0.5/-0 | 60 °C/60% RH |
| 6 | Time on Label (TOL) | ≤30 °C/60% RH | TOL | 30 °C/60% RH | NA | NA | NA |

Note 1: CAUTION – To use the “accelerated equivalent” soak conditions, correlation of damage response (including electrical, after soak and reflow), should be established with the “standard” soak conditions. Alternatively, if the known activation energy for moisture diffusion of the package materials is in the range of 0.40–0.48 eV or 0.30–0.39 eV, the “accelerated equivalent” may be used. Accelerated soak times may vary due to material properties (e.g. mold compound, encapsulant, etc.). JEDEC document JESD22-A120 provides a method for determining the diffusion coefficient.

Note 2: The standard soak time includes a default value of 24 hours for semiconductor Manufacturer’s Exposure Time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor’s facility.

If the actual MET is less than 24 hours, the soak time may be reduced. For soak conditions of 30 °C/60% RH, the soak time is reduced by 1 hour for each hour the MET is less than 24 hours. For soak conditions of 60 °C/60% RH, the soak time is reduced by 1 hour for each 5 hours the MET is less than 24 hours.

If the actual MET is greater than 24 hours the soak time must be increased. If soak conditions are 30 °C/60% RH, the soak time is increased 1 hour for each hour that the actual MET exceeds 24 hours. If soak conditions are 60 °C/60% RH, the soak time is increased 1 hour for each 5 hours that the actual MET exceeds 24 hours.

Note 3: Supplier may extend the soak times at their own risk.

# Notes

# Section 3

# TEST EQUIPMENT AND SERVICE AIDS

## 1.0 Recommended Test Equipment

The list of equipment contained in Table 3-1 includes most of the standard test equipment required for servicing Motorola mobile radios.

*Table 3-1 Recommended Test Equipment*

| Equipment | Characteristic | Example | Application |
|---|---|---|---|
| Service Monitor | Can be used as a substitute for items marked with an asterisk (*) | Aeroflex 3920, or equivalent | Frequency/deviation meter and signal generator for wide-range troubleshooting and alignment |
| Digital RMS Multimeter* | 100 µV to 300 V<br>5 Hz to 1 MHz<br>10 Meg Ohm Impedance | Fluke 179 or equivalent (www.fluke.com) | AC/DC voltage and current measurements. Audio voltage measurements. |
| RF Signal Generator* | 100 MHz to 1 GHz<br>-130 dBM to +10 dBM<br>FM Modulation 0 kHz to 10 kHz | Agilent N5181 (www.agilent.com) or equivalent | Receiver measurements |
| Oscilloscope* | 2 Channels<br>50 MHz Bandwidth<br>5 mV/div to 20 V/div | Tektronix TDS1001b (www.tektronix.com) or equivalent | Waveform measurements |
| Power Meter and Sensor* | 5% Accuracy<br>100 MHz to 500 MHz<br>50 Watts | Bird 43 Thruline Watt Meter (www.bird-electronic.com) or equivalent | Transmitter power output measurements |
| RF Millivolt Meter | 100 mV to 3 V RF<br>10 kHz to 1 GHz | Boonton 92EA (www.boonton.com) or equivalent | RF level measurements |
| Power Supply | 0 V to 32 V<br>0 A to 20 A | B&K Precision 1790 (www.bkprecision.com) or equivalent | Voltage supply |

## 2.0 Service Aids

Table 3-2 lists the service aids recommended for working on the radio. While all of these items are available from Motorola, most are standard workshop equipment items, and any equivalent item capable of the same performance may be substituted for the item listed.

*Table 3-2 Service Aids*

| Motorola Part Number | Description | Application |
|---|---|---|
| RLN4460_ | Test Box | Enables connection to audio/accessory jack. Allows switching for radio testing. |
| PMVN4130_ | Customer Programming Software and AirTracer on CD-ROM | CPS allows Dealers/Distributors to program radio parameters. AirTracer allows the capturing of radio traffic into logs for analysis by Motorola. |
| PMVN4131_ | Tuner on CD-ROM | Radio Tuning. Only Motorola Service Centers or Authorized Motorola Service Dealers can perform this function. |
| PMKN4147_ | Front Telco MMP USB Programming Cable | Connects the radio's front connector to a USB port for radio programming and data applications. |
| PMKN4148_ | Back 20 Pin MAP USB Programming Cable | Connects the radio's rear connector to a USB port for radio programming and data applications. |
| PMKN4149_ | Back 20 Pin MAP Test and USB Programming Cable | Connects the radio's rear connector to a USB port for radio programming, data applications, testing and alignment. |
| PMKN4150_ | Back 20 Pin MAP Test Cable | Connects the radio's rear connector for testing. Must use in conjunction with PMKN4147_ (Front Telco MMP USB Programming Cable) for radio programming and alignment. |
| PMKN4151_ | Back 16 Pin MAP Universal Cable | Connects the radio's rear connector to the center 16 pins with unterminated connectors at the user end. |
| HPN4007_ | Power Supply | Provides the radio with power when bench testing. |
| 6686119B01 | Control Head Dismantling Tool | Assists in the removal of radio control head. |

# 3.0 Programming Cables

*Figure 3-1 Front Telco MMP USB Programming Cable PMKN4147_*

*Figure 3-2 Back 20 Pin MAP USB Programming Cable PMKN4148_*

# 4.0 Programming and Test Cable

| WIRE DIAGRAM | | | | |
|---|---|---|---|---|
| 20 PIN ACCESSORY PORT CONNECTOR | | WIRE COLOUR | USB | DB25P |
| PIN 19 | VCC (5v) (USB VBUS) | RED | PIN 1 | |
| PIN 18 | DATA - | WHITE | PIN 2 | |
| PIN 17 | DATA + | GREEN | PIN 3 | |
| PIN 20 | GROUND (USB) | BLACK | PIN 4 | |
| | DRAIN WIRE AND BRAID | DRAIN WIRE/BRAID | SHELL | |
| PIN 1 | SPEAKER - | ORANGE | | PIN 2 & 7 |
| PIN 2 | EXT MIC AUDIO | GREY | | PIN 10 & 15 |
| PIN 3 | PROGM INPUT (EXT. PTT) | PINK | | PIN 20 |
| PIN 5 | FLAT TX AUDIO | YELLOW | | PIN 18 |
| PIN 7 | GROUND (DB25) | BLACK | | PIN 16 |
| PIN 15 | RSSI | BROWN | | PIN 19 |
| PIN 16 | SPEAKER + | PURPLE | | PIN 1 & 5 |

*Figure 3-3 Back 20 Pin MAP Test and USB Programming Cable PMKN4149_*

# 5.0 Test Cable

*Figure 3-4 Back 20 Pin MAP Test Cable PMKN4150_*

*Table 3-3 Wire Diagram for PMKN4150_*

| WIRE DIAGRAM | | | |
|---|---|---|---|
| 20 PIN ACCESSORY PORT CONNECTOR | | WIRE COLOUR | DB25P |
| PIN No. | DESCRIPTION | -- | -- |
| 1 | SPEAKER - | ORANGE | 2 & 7 |
| 2 | EXT MIC | GREY | 10 & 15 |
| 3 | GPI_1 (EXT PTT) | PINK | 20 |
| 5 | FLAT TX | YELLOW | 18 |
| 7 | GROUND | BLACK | 16 |
| 15 | RSSI | BROWN | 19 |
| 16 | SPEAKER + | PURPLE | 1 & 5 |

# 6.0 Accessory Cable

*Figure 3-5 Back 16 Pin MAP Universal Cable PMKN4151_*

*Table 3-4 Wire Diagram for PMKN4151_*

| WIRE DIAGRAM | | | | | | |
|---|---|---|---|---|---|---|
| 16 PIN CONNECTOR | WIRE COLOUR | WIRE LEAD SIDE | | 16 PIN CONNECTOR | WIRE COLOUR | WIRE LEAD SIDE |
| 1 | BLACK | NC | | 9 | PURPLE | NC |
| 2 | WHITE | NC | | 10 | GREY | NC |
| 3 | GREEN | NC | | 11 | PINK | NC |
| 4 * | YELLOW / DRAIN WIRE | NC * | | 12 | WHT / BLK | NC |
| 5 | ORANGE | NC | | 13 | WHT / BRN | NC |
| 6 | BLUE | NC | | 14 | WHT / RED | NC |
| 7 | BROWN | NC | | 15 | WHT / ORG | NC |
| 8 | RED | NC | | 16 | WHT / GRN | NC |

(*) NOTE: CRIMP YELLOW WIRE AND DRAIN WIRE TO TERMINAL ON 26 PIN CONNECTOR.
TIN YELLOW WIRE AND DRAIN WIRE TOGETHER ON WIRE LEAD SIDE.

# Notes

# Section 4

# POWER-UP SELF TEST

**NOTE:** This section is for reference only. If at any time one of the error codes is present, the radio should be returned to a qualified Motorola Service Center.

## 1.0 Power-Up Error Codes

When the radio is turned on (powered-up), the radio performs cursory tests to determine if its basic electronics and software are in working order. Problems detected during these tests are presented as error codes on the radio's display. The presence of an error should prompt the user that a problem exists and that a service technician should be contacted.

Self-test errors are classified as either fatal or non-fatal. Fatal errors inhibit user operation; non-fatal errors do not. Use the following table to aid in understanding particular power-up error code displays.

*Table 4-1 Power-Up Error Codes*

| Error Code | Description | Error Type | Corrective Action |
|---|---|---|---|
| ERROR 01/02 | FLASH ROM Codeplug Checksum | NON-FATAL | Reprogram the codeplug. |
| ERROR 01/22 | Tuning Codeplug Checksum | NON-FATAL | Reprogram the tuning partition/ codeplug. To be done by Motorola Repair Centers . |
| FAIL 01/82 | FLASH ROM Codeplug Checksum | FATAL | Reprogram codeplug. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit. |
| FAIL 01/90 | General Hardware Error | FATAL | Retest radio by turning it off and turning it on again. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit. |
| FAIL 01/92 | Security Partition Checksum | FATAL | Reprogram the security partition/ codeplug. If message reoccurs, send radio to nearest Motorola Repair Centers to replace Service Kit. |
| FAIL 01/93 | FlashPORT AUTHENT CODE Failure | FATAL | Send radio to nearest Motorola Repair Centers to replace Service Kit. |
| FAIL 01/A2 | Tuning Codeplug Checksum | FATAL | Reprogram the tuning partition/ codeplug. To be done by Motorola Repair Centers . |
| FAIL 02/90 | RF Hardware Error | FATAL | Send radio to nearest Motorola Repair Centers. |

# Notes

# XiR™ M6660 Mobile Radios

## Chapter 2

## Mobile Radio Block Diagram

Issue: June, 2013

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# Chapter 2 – MOTOTRBO XiR™ M6660 Mobile Radio Block Diagram

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### Section 1

1.0 MOTOTRBO XiR™ M6660 Mobile Radio Block Diagram ..... 1-1

# Notes

# Section 1

## 1.0 MOTOTRBO XiR™ M6660 Mobile Radio Block Diagram

Figure 1-1: shows the MOTOTRBO **XiR™ M6660** Mobile Radio Block Diagram. This block diagram should be used for reference for all subsequent chapters.

| Pin # | Pin Name |
|---|---|
| 1 | D+ |
| 2 | HANDSET_AUDIO |
| 3 | KEY_ROW/cable_detect |
| 4 | PTT |
| 5 | MIC+ |
| 6 | MIC_GROUND |
| 7 | HOOK/VBUS_detect |
| 8 | KEY_COL/cable_detect |
| 9 | 5V_SW |
| 10 | D- |

| Pin # | MAP CONNECTOR |
|---|---|
| | |
| 2 | EXT_MIC_AUDIO |
| 11 | FLAT_FILTERED_RX AUDIO |
| 5 | FLAT_TX_AUDIO |
| 7 | GROUND |
| 20 | USB GROUND |
| 8 | GPIO_4 -Monitor |
| 12 | GPIO_7 -Channel Activity |
| 14 | GPIO_8 OR TTR |
| 6 | GPIO_3 |
| 9 | EMERGENCY |
| 10 | IGNITION SENSE |
| 3 | GPI_1 -PTT |
| 4 | GPO_2 -External Alarm |
| 15 | RSSI |
| 18 | USB D- |
| 17 | USB D+ |
| 19 | USB VBUS |
| 1 | SPKR- |
| 16 | SPKR+ |
| 13 | SWB+ |

*Figure 1-1: Top Level Block Diagram*

## Notes

# XiR™ M6660 Mobile Radios

## Chapter 3

## Control Head

## Service Information

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# Chapter 3 – Control Head Service Information

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4.0 Alphanumeric Display Control Head Parts List ..... 3-5

# Notes

# Section 1

# OVERVIEW

## 1.0 Alphanumeric Display Model

The Control Head contains the internal speaker, the On/Off button, the Volume Changing Rocker, the Channel Changing Rocker, the accessory connector, several buttons to operate the radio, several indicator Light Emitting Diodes (LED) to inform the user about the radio status, and a Liquid Crystal Display (LCD) for alphanumerical information e.g., channel number or call address name. The switches, indicators, and LCD on the Control Head are indirectly controlled by the processor in the radio.

# Notes

# Section 2

# TROUBLESHOOTING CHARTS

## 1.0 Control Head Troubleshooting Flow Chart

### 1.1 On/Off

## 1.2 Display

Power Up Alert Tone is OK but display is incorrect
FT6004 = 3.3V?
FT6006 = 3.3V?
No
Replace flex cable
Yes
LCD flex cable inserted and locked down in J6001?
No
With power off, re-insert and lock down LCD flex cable
Yes
Boot logo displayed?
Yes
Confirm matching model number and control head type, then update radio and control head with latest firmware and codeplugs
No
Check control head with a known functional brick

## 1.3 Speaker Audio

## 1.4 Front MMP USB

# Section 3

# CONTROL HEAD PCBS/SCHEMATICS/PARTS LISTS

## 1.0 Allocation of Schematics and Circuit Boards

*Table 3-1 Alphanumeric Display Control Head Schematic Diagram and Parts List*

| | |
|---|---|
| **PCB :**<br>Alphanumeric Display Control Head<br>**84012531002-B** Main Board Top Side<br>**84012531002-B** Main Board Bottom Side | <br><br>Page 3-3<br>Page 3-3 |
| **SCHEMATIC**<br>Alphanumeric Display Control Head Schematic Diagram | Page 3-4 |
| **Parts List**<br>**84012531002-B** Alphanumeric Display Control Head | Page 3-5 |

# Notes

## 2.0 Alphanumeric Display Control Head – PCB 84012531002-B

*Top Side View*

*Bottom Side View*

*Alphanumeric Display Control Head – PCB 84012531002-B*

# 3.0 Alphanumeric Display Control Head Schematic

*Alphanumeric Display Control Head Schematic Diagram*

## 4.0 Alphanumeric Display Control Head Parts List

| Circuit Ref. | Motorola Part No. |
|---|---|
| C6000 | 2113945A05 |
| C6001 | NOT PLACED |
| C6002 | 2113946B04 |
| C6003 | 21667009166 |
| C6004 | 2113945A05 |
| C6005 | 2113945B02 |
| C6006 | 2113945A05 |
| C6007 | 2113945A05 |
| C6008 | 2113945L29 |
| C6009 | NOT PLACED |
| C6010 | 2113945A05 |
| C6011 | 2113945A05 |
| C6012 | 2113946B04 |
| C6013 | 2113945B02 |
| C6014 | 2113945B02 |
| C6015 | 2113946B04 |
| C6016 | 2113945B02 |
| C6017 | 2113945B02 |
| C6018 | 2113945A05 |
| C6019 | 2113945A05 |
| C6020 | NOT PLACED |
| C6021 | 2113945A05 |
| C6022 | 2113945A05 |
| C6023 | 2113945A05 |
| C6024 | 2113945A05 |
| C6025 | NOT PLACED |
| C6026 | NOT PLACED |
| C6027 | 2113945A05 |
| C6028 | 2113945A05 |
| C6029 | 2113945A05 |
| C6030 | 2113945A05 |
| C6031 | 2113945A05 |
| C6032 | NOT PLACED |
| C6033 | 2113956A51 |
| C6034 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C6035 | 2113945A05 |
| C6036 | 2113945A05 |
| C6037 | 2113945A05 |
| C6038 | 2113945B02 |
| C6039 | 2113945A05 |
| C6040 | 2113946B04 |
| C6041 | 2113945A05 |
| C6042 | 2113945A05 |
| C6043 | 2113945A05 |
| C6044 | 2113945A05 |
| C6045 | NOT PLACED |
| C6046 | NOT PLACED |
| C6047 | 2113946B04 |
| C6048 | 2113946B04 |
| C6049 | 2113945A05 |
| C6050 | 21667009168 |
| C6051 | 2113945B02 |
| C6052 | 21667009168 |
| C6053 | 21667009162 |
| C6054 | 21667009162 |
| C6055 | 21667009162 |
| C6056 | 21667009162 |
| C6057 | NOT PLACED |
| C6058 | 2113946B04 |
| C6059 | NOT PLACED |
| C6060 | NOT PLACED |
| C6061 | NOT PLACED |
| C6062 | 2113945A05 |
| C6063 | NOT PLACED |
| C6064 | NOT PLACED |
| D6000 | 4805729G75 |
| D6001 | 4805729G74 |
| D6002 | 4805729G73 |
| D6003 | NOT PLACED |
| D6004 | 48012255001 |
| D6005 | 48012219001 |
| D6006 | 48012219001 |
| D6007 | 48012049001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| D6008 | 48012219001 |
| D6009 | 48012219001 |
| D6011 | 48012219001 |
| D6012 | 48012219001 |
| D6013 | 48012219001 |
| D6014 | 48012219001 |
| D6015 | 4813978C09 |
| DS6001 | NOT PLACED |
| E6000 | 7688697V14 |
| E6001 | NOT PLACED |
| E6002 | NOT PLACED |
| E6003 | NOT PLACED |
| E6004 | NOT PLACED |
| E6005 | NOT PLACED |
| E6006 | NOT PLACED |
| E6007 | NOT PLACED |
| E6008 | NOT PLACED |
| E6009 | NOT PLACED |
| E6010 | NOT PLACED |
| E6011 | NOT PLACED |
| E6012 | NOT PLACED |
| E6241 | NOT PLACED |
| J6000 | 2864287B01 |
| J6001 | 0916769H01 |
| J6002 | 0915767H01 |
| M6003 | 39012067001 |
| M6004 | 39012067001 |
| M6005 | 39012067001 |
| P6000 | NOT PLACED |
| P6001 | 2815162H01 |
| Q6000 | 4815261H01 |
| Q6001 | 4815261H01 |
| Q6002 | 4815261H01 |
| Q6003 | NOT PLACED |
| Q6004 | NOT PLACED |
| Q6005 | NOT PLACED |
| Q6006 | NOT PLACED |
| Q6007 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| Q6008 | NOT PLACED |
| Q6009 | 4815261H01 |
| Q6010 | 4885065Y01 |
| Q6018 | 4885065Y01 |
| Q6020 | 4809939C47 |
| Q6021 | 4815272H01 |
| Q6022 | NOT PLACED |
| R6000 | NOT PLACED |
| R6001 | 0613952Q43 |
| R6002 | NOT PLACED |
| R6003 | NOT PLACED |
| R6004 | 0613952Q85 |
| R6005 | 0613952Q93 |
| R6006 | 0613952Q59 |
| R6007 | NOT PLACED |
| R6008 | NOT PLACED |
| R6009 | 0613952Q44 |
| R6010 | NOT PLACED |
| R6011 | NOT PLACED |
| R6012 | NOT PLACED |
| R6013 | NOT PLACED |
| R6014 | NOT PLACED |
| R6015 | NOT PLACED |
| R6016 | NOT PLACED |
| R6017 | NOT PLACED |
| R6018 | NOT PLACED |
| R6019 | NOT PLACED |
| R6020 | NOT PLACED |
| R6021 | NOT PLACED |
| R6022 | 0613952R66 |
| R6023 | 0613952R01 |
| R6024 | 0613952R01 |
| R6025 | NOT PLACED |
| R6026 | NOT PLACED |
| R6027 | NOT PLACED |
| R6028 | NOT PLACED |
| R6029 | 0613952R01 |
| R6030 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R6031 | NOT PLACED |
| R6032 | NOT PLACED |
| R6033 | NOT PLACED |
| R6034 | NOT PLACED |
| R6035 | 0613952R18 |
| R6036 | 0613952R04 |
| R6037 | 0613952R09 |
| R6038 | 0613952R16 |
| R6039 | 0613952R28 |
| R6040 | 0613952R18 |
| R6041 | 0613952R04 |
| R6042 | 0613952R09 |
| R6043 | 0613952R16 |
| R6044 | 0613952R28 |
| R6045 | 0613952Q89 |
| R6046 | 0613952Q89 |
| R6047 | NOT PLACED |
| R6048 | NOT PLACED |
| R6049 | NOT PLACED |
| R6050 | 0613952N15 |
| R6051 | 0613952M01 |
| R6052 | NOT PLACED |
| R6053 | NOT PLACED |
| R6054 | 0613952R66 |
| R6055 | NOT PLACED |
| R6056 | 0613952R66 |
| R6057 | 0613952R66 |
| R6058 | NOT PLACED |
| R6059 | 0613952R66 |
| R6060 | 0613952R01 |
| R6061 | NOT PLACED |
| R6062 | NOT PLACED |
| R6063 | 0613952Q66 |
| R6064 | 0613952R01 |
| R6065 | NOT PLACED |
| R6066 | 0613952Q73 |
| R6067 | 0613952R17 |
| R6068 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R6069 | NOT PLACED |
| R6070 | NOT PLACED |
| R6071 | NOT PLACED |
| R6072 | NOT PLACED |
| R6073 | NOT PLACED |
| R6074 | NOT PLACED |
| R6075 | NOT PLACED |
| R6076 | NOT PLACED |
| R6077 | NOT PLACED |
| R6078 | 0613952R04 |
| R6079 | 0613952R33 |
| R6080 | 0613952R33 |
| R6081 | 0613952R16 |
| R6082 | 0613952R49 |
| R6083 | 0613952Q73 |
| R6084 | 0613952Q53 |
| R6085 | 0613952R33 |
| R6086 | 0613952R35 |
| R6087 | 0613952R49 |
| R6088 | 0613952Q73 |
| R6089 | 0613952Q53 |
| R6090 | 0613952Q73 |
| R6091 | 0613952Q73 |
| R6092 | NOT PLACED |
| R6093 | NOT PLACED |
| R6094 | NOT PLACED |
| R6095 | NOT PLACED |
| R6096 | 0613952R66 |
| R6097 | 0613952Q53 |
| R6098 | 0613952Q53 |
| R6099 | 0613952Q53 |
| R6100 | 0613952Q53 |
| R6101 | 0613952Q53 |
| R6102 | 0613952Q53 |
| R6103 | 0613952Q53 |
| R6104 | 0613952Q53 |
| R6105 | 0613952Q54 |
| R6106 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R6107 | NOT PLACED |
| R6108 | NOT PLACED |
| R6109 | NOT PLACED |
| R6110 | NOT PLACED |
| R6111 | 0613952R01 |
| R6112 | NOT PLACED |
| R6113 | 0613952R17 |
| R6114 | 0613952R66 |
| R6115 | 0613952R66 |
| R6116 | 0613952R66 |
| R6117 | 0613952R66 |
| R6118 | 0613952R66 |
| R6119 | 0613952R66 |
| R6120 | 0613952R66 |
| R6121 | 0613952R66 |
| R6122 | 0613952G67 |
| R6123 | 0613952G67 |
| R6124 | 0613952G67 |
| R6125 | 0613952R18 |
| R6126 | 0613952R43 |
| R6127 | 0613952R01 |
| R6128 | 0613952Q89 |
| R6129 | 0613952R49 |
| R6130 | 0613952R18 |
| R6131 | 0613952R43 |
| R6132 | 0613952R17 |
| R6133 | 0613952R01 |
| R6134 | 0613952N01 |
| R6135 | 0613952Q89 |
| R6136 | 0613952R28 |
| R6137 | 0613952H37 |
| R6138 | 0613952R49 |
| R6139 | 0613952Q37 |
| R6140 | NOT PLACED |
| R6141 | 0613952Q53 |
| R6142 | 0613952Q53 |
| R6143 | NOT PLACED |
| R6144 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R6145 | 0613952R28 |
| R6146 | 0613952R28 |
| R6148 | NOT PLACED |
| S6000 | NOT PLACED |
| S6001 | NOT PLACED |
| S6002 | NOT PLACED |
| S6003 | NOT PLACED |
| S6004 | NOT PLACED |
| S6005 | NOT PLACED |
| S6006 | NOT PLACED |
| S6007 | NOT PLACED |
| S6008 | NOT PLACED |
| S6009 | NOT PLACED |
| S6020 | NOT PLACED |
| U6002 | 51012145002 |
| U6004 | 5188691V50 |
| VR6000 | 4813979P10 |
| VR6001 | 4813977A43 |
| VR6002 | 4813977A43 |
| VR6003 | 4813977A43 |
| VR6004 | 4813979P10 |
| VR6005 | 4813977A43 |
| VR6006 | 4813977A43 |
| VR6007 | 4813977A43 |
| VR6008 | 4813977A43 |
| VR6009 | 4813977A43 |
| VR6010 | 4813979P10 |
| VR6011 | 4813979P10 |
| VR6012 | 4813977A43 |
| VR6013 | 4813977A43 |
| VR6014 | 48012153001 |

# XiR™ M6660 Mobile Radios

## Chapter 4

## Generic Option Board (GOB)

## Service Information

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# Notes

# Section 1

# TROUBLESHOOTING CHART

## 1.0 Generic Option Board (GOB) Troubleshooting Chart

* To check SSI lines, GOB needs to connect with radio
* All the SSI lines must probe with oscilloscope

# Notes

# Section 2

# GENERIC OPTION BOARD (GOB) PCBS/SCHEMATICS/ PARTS LIST

## 1.0 Allocation of Schematic and Circuit Board

*Table 2-1 GOB Schematic Diagram and Parts List*

| | |
|---|---|
| **PCB:**<br>GOB<br>**84012198001-A** Main Board Top Side<br>**84012198001-A** Main Board Bottom Side | <br><br>Page 2-3<br>Page 2-4 |
| **Schematic**<br>GOB Schematic Diagram | **Page 2-5** |
| **Parts List**<br>**84012198001-A** | **Page 2-6** |

# Notes

## 2.0 Generic Option Board (GOB) – PCB 84012198001-A/Schematic



***GOB – PCB 84012198001-A Top Side***

***GOB – PCB 84012198001-A Bottom Side***

***GOB Schematic Diagram***

## 3.0 GOB Parts List

| Circuit Ref. | Motorola Part No. |
|---|---|
| C5100 | 2113946S35 |
| C5101 | 2113945A05 |
| C5102 | 2113946S35 |
| C5103 | 2113945Y02 |
| C5104 | 2113945D01 |
| C5105 | 2113945A11 |
| C5106 | 2113945D01 |
| C5107 | 2113956B21 |
| C5108 | 2113956B21 |
| C5109 | 2113945A05 |
| C5110 | 2113945A11 |
| C5111 | 2113945D01 |
| C5112 | 2113945Y02 |
| C5113 | 2113956B21 |
| C5114 | 2113956B21 |
| C5115 | 2113945Y02 |
| C5116 | 2113945D01 |
| C5117 | 2113945D01 |
| C5118 | 2113945Y02 |
| C5119 | 2113956B21 |
| C5120 | 2113945Y02 |
| C5121 | 2113944A46 |
| C5125 | 2113945Y02 |
| C5126 | 2115153H22 |
| C5127 | 2115153H22 |
| C5128 | 2113945Y02 |
| C5129 | 2113945Y02 |
| C5130 | 2113945Y02 |
| C5131 | 2113945Y02 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C5132 | 2113945A05 |
| C5134 | 2113945Y02 |
| C5135 | 2113945Y02 |
| C5136 | 2113945Y02 |
| C5137 | 2113945Y02 |
| C5138 | 2113945Y02 |
| C5139 | 2113945Y02 |
| C5140 | 2113945Y02 |
| C5200 | 2113945Y02 |
| C5201 | 2113945Y02 |
| E5100 | 7686949J08 |
| E5101 | 530004-001-00 |
| E5102 | 530004-001-00 |
| E5200 | 24001720002 |
| J5000 | 09012068001 |
| J5004 | 2887818K02 |
| PASTE | 11012015001 |
| PCB | 84012198001 |
| Q5000 | 4816134H01 |
| R5100 | 0613952P15 |
| R5101 | 0613952N87 |
| R5104 | 0613952G67 |
| R5105 | 0613952R01 |
| R5106 | 0613952R01 |
| R5110 | 0613952R01 |
| R5112 | 0613952R25 |
| R5113 | 0613952R25 |
| R5114 | 0613952R25 |
| R5122 | 0613952Q25 |
| R5123 | 0613952Q25 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R5124 | 0613952R01 |
| R5125 | 0613952R32 |
| R5128 | NOT PLACED |
| R5129 | 0613952R01 |
| R5130 | 0613952R25 |
| R5131 | 0613952R25 |
| R5132 | 0613952R25 |
| R5133 | 0613952G67 |
| R5134 | NOT PLACED |
| R5135 | 0613952R01 |
| R5136 | 0613952R01 |
| R5137 | 0613952R66 |
| R5138 | NOT PLACED |
| R5139 | NOT PLACED |
| R5140 | 0613952R25 |
| R5141 | 0613952R25 |
| R5142 | 0613952R25 |
| R5200 | 0613952R01 |
| R5201 | NOT PLACED |
| R5202 | 0613952R01 |
| R5203 | NOT PLACED |
| R5204 | 0613952R01 |
| R5206 | 0613952K58 |
| R5207 | 0613952K58 |
| R5208 | 0613952R01 |
| R5300 | 0613952Q33 |
| R5301 | 0613952Q33 |
| R5302 | 0613952Q33 |
| R5303 | 0613952Q33 |
| SH5000 | 26012099001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| U5101 | 548447-001-00 |
| U5102 | 5175772B43 |
| U5103 | 51012009003 |
| U5104 | 5186053Y60 |
| U5105 | 51012336001 |
| U5106 | 5188085K03 |
| U5107 | 51012205001 |
| U5108 | 5189153N01 |
| U5109 | 5171767H01 |
| U5110 | 5171767H01 |
| U5111 | NOT PLACED |
| VR5100 | 48012131001 |
| VR5101 | 4815040H01 |
| Y5101 | 93012053001 |
| --- | 5482624Y02 |

# XiR™ M6660 Mobile Radios

## Chapter 5

## Controller

## Service Information

Issue: June, 2013

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# Notes

# Section 1

# TROUBLESHOOTING CHARTS

## 1.0 Controller Troubleshooting Chart

# 2.0 Power-Up Troubleshooting Chart

# 3.0 MMP USB (Radio is in Device Mode) Troubleshooting Chart

# 4.0 MAP USB (Radio is in Device Mode) Troubleshooting Chart

# 5.0 Audio Troubleshooting Chart

# Notes

# Section 2

# CONTROLLER SCHEMATICS/PARTS LISTS

## 1.0 Allocation of Schematics and Parts Lists

### 1.1 Controller Circuits

This Chapter shows the Schematics and the Parts List for the Controller circuits.

*Table 2-1 Controller R1 Schematic Diagrams and Parts List*

| | |
|---|---|
| **Controller R1 used on PCB:**<br>**84012504002_B VHF (136–174 MHz), 1–25 W**<br>**84012505002_B VHF (136–174 MHz), 25–45 W**<br>**84012591001_A UHF1 (403–470 MHz), 1–25 W**<br>**84012592001_A UHF1 (403–470 MHz), 25–40 W** | |
| **SCHEMATICS** | |
| **Controller Top Level** | **Page 2-3** |
| **Controller DC Supply** | **Page 2-4** |
| **Controller Audio** | **Page 2-5** |
| **Controller Peripheral (sheet 1 of 2)** | **Page 2-6** |
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| **Parts Lists** | |
| **Controller R1** | **Page 2-10** |

# Notes

## 2.0 Controller R1 Schematic Diagrams

***Controller – Top Level Schematic Diagram***

***Controller DC Supply Schematic Diagram***

## MIC_BIAS

MAP TX DATA/AUDIO TABLE

| MAP_AUD_SEL* | U3202 PIN 1 | INPUT SELECTED |
|---|---|---|
| L | H | MAP_TX_DATA |
| H | L | EXT_MIC+_MAP |

* POWER ON STATE IS H

## CODEC

## RX_HANDSET_AUDIO

## AUDIO_PA

***Controller Audio Schematic Diagram***

***Controller Peripheral Schematic Diagram (sheet 1 of 2)***

# 14-PIN OPTION BOARD INTERFACE

***Controller Peripheral Schematic Diagram (sheet 2 of 2)***

## Controller Microprocessor Schematic Diagram

***Controller Memories Schematic Diagram***

## 3.0 Controller R1 Parts List

| Circuit Ref. | Motorola Part No. |
|---|---|
| C1000M1 | 2113945Y02 |
| C1001M1 | 2113945Y02 |
| C1002M1 | 2113946K03 |
| C1003M1 | 2113945Y02 |
| C1005M1 | 2113945Y02 |
| C1006M1 | 2113945Y02 |
| C1007M1 | 2113945Y02 |
| C1008M1 | 2113946D05 |
| C1009M1 | 2113945Y02 |
| C1010M1 | 2113945Y02 |
| C1011M1 | 2113945B02 |
| C1012M1 | 2113945Y02 |
| C1013M1 | 2113945Y02 |
| C1014M1 | 2113945Y02 |
| C1015M1 | 2113945B02 |
| C1017M1 | 21667009162 |
| C1018M1 | 21667009162 |
| C1019M1 | 21667009162 |
| C1020M1 | 21667009162 |
| C1021M1 | 2113945Y02 |
| C1022M1 | 2113945Y02 |
| C1023M1 | 2113945Y02 |
| C1025M1 | 2113945Y02 |
| C1026M1 | 2113945Y02 |
| C1028M1 | 2113945Y02 |
| C1029M1 | 2113956B54 |
| C1032M1 | 2113956B54 |
| C1035M1 | 2113945B02 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C1036M1 | 2113946D05 |
| C1041M1 | 2113945B02 |
| C1042M1 | 2113945Y02 |
| C1043M1 | 2113956B54 |
| C1044M1 | 2113945B02 |
| C1045M1 | 2113945B02 |
| C1047M1 | 2113945Y02 |
| C1060M1 | 2113945B02 |
| C1061M1 | 2113945Y02 |
| C1062M1 | 2113945Y02 |
| C1063M1 | NOT PLACED |
| C1064M1 | 2113945Y02 |
| C1065M1 | NOT PLACED |
| C2000M1 | 2113945Y02 |
| C2001M1 | 2113945Y02 |
| C2002M1 | 2113945B02 |
| C2003M1 | 21667009162 |
| C2004M1 | 2113956B54 |
| C2005M1 | 2113946D05 |
| C2006M1 | 2113945Y02 |
| C2007M1 | 2113945Y02 |
| C2008M1 | 2113945B02 |
| C2009M1 | 21667009162 |
| C2010M1 | 2113945Y02 |
| C2011M1 | 2113945Y02 |
| C2012M1 | 2113945Y02 |
| C2013M1 | 2113945Y02 |
| C2014M1 | 2113945B02 |
| C2015M1 | 21667009162 |
| C2016M1 | 2113956B54 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C2020M1 | 2113956B54 |
| C2021M1 | 2113956D59 |
| C2022M1 | 2113956D59 |
| C3102M1 | 21009337414 |
| C3103M1 | 21667009166 |
| C3104M1 | 2113946F08 |
| C3105M1 | 2113956C25 |
| C3106M1 | 2113946B01 |
| C3107M1 | 2113944C06 |
| C3108M1 | 2113945Y02 |
| C3109M1 | 21667009166 |
| C3110M1 | 2113944C06 |
| C3111M1 | 2113946J04 |
| C3112M1 | 2113945Y02 |
| C3113M1 | 2113946S35 |
| C3115M1 | 2113944C06 |
| C3116M1 | 2113955D13 |
| C3117M1 | 2113955D13 |
| C3118M1 | NOT PLACED |
| C3119M1 | 2113945Y02 |
| C3120M1 | 2113956E60 |
| C3121M1 | 2113956D58 |
| C3122M1 | 2113956A51 |
| C3123M1 | 2113956A51 |
| C3124M1 | 2113946D07 |
| C3125M1 | 2113946D05 |
| C3126M1 | 2113944C06 |
| C3127M1 | 2113946S35 |
| C3128M1 | 2113946D05 |
| C3129M1 | 2113945Y02 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C3130M1 | 2113946D05 |
| C3131M1 | 2113946A02 |
| C3132M1 | 2113946D05 |
| C3133M1 | 2113946D05 |
| C3134M1 | 2113946S35 |
| C3135M1 | 2113956A51 |
| C3136M1 | 21012095001 |
| C3137M1 | 2113946D05 |
| C3139M1 | 2113956A51 |
| C3140M1 | 21012095001 |
| C3141M1 | NOT PLACED |
| C3142M1 | 21012129001 |
| C3143M1 | 21667009366 |
| C3144M1 | NOT PLACED |
| C3145M1 | 2113944C06 |
| C3146M1 | 21012129001 |
| C3147M1 | 2113946F08 |
| C3149M1 | 2113956A51 |
| C3150M1 | 2113956A51 |
| C3151M1 | 21667009384 |
| C3152M1 | 2113944C06 |
| C3153M1 | 2113956A51 |
| C3154M1 | 2113955D13 |
| C3155M1 | 2113945Y02 |
| C3156M1 | 2113945Y02 |
| C3160M1 | NOT PLACED |
| C3171M1 | 2113945B02 |
| C3173M1 | 2113945B02 |
| C3175M1 | 2113946A01 |
| C3176M1 | 2113944C48 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C3180M1 | NOT PLACED |
| C3200M1 | NOT PLACED |
| C3201M1 | NOT PLACED |
| C3202M1 | NOT PLACED |
| C3203M1 | 2113955D37 |
| C3204M1 | 2113955D37 |
| C3205M1 | 21667009166 |
| C3206M1 | 2113945L29 |
| C3207M1 | NOT PLACED |
| C3208M1 | 2113956C37 |
| C3209M1 | 2113945Y02 |
| C3210M1 | 2113945Y02 |
| C3211M1 | 2113945A03 |
| C3212M1 | 2113955D37 |
| C3213M1 | 2113945A03 |
| C3214M1 | 2113955D37 |
| C3215M1 | 2113956F49 |
| C3216M1 | 2113945Y02 |
| C3217M1 | 2113956B91 |
| C3218M1 | 2113956A51 |
| C3219M1 | 2113956A51 |
| C3220M1 | 2113946F05 |
| C3221M1 | 2113945Y02 |
| C3222M1 | 2113956A51 |
| C3223M1 | 2113945Y02 |
| C3224M1 | 2113946F05 |
| C3225M1 | 2113945Y02 |
| C3226M1 | NOT PLACED |
| C3227M1 | 2113956A51 |
| C3228M1 | 2113945Y02 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C3229M1 | 2113956A51 |
| C3230M1 | 2113945Y02 |
| C3231M1 | 2113945Y02 |
| C3232M1 | 2113945Y02 |
| C3233M1 | 2113945L49 |
| C3235M1 | 2113956E39 |
| C3236M1 | 2113945C31 |
| C3237M1 | 21009337414 |
| C3238M1 | 21667009170 |
| C3239M1 | 21667009170 |
| C3240M1 | 2113945L49 |
| C3241M1 | 2113956B91 |
| C3248M1 | NOT PLACED |
| C3249M1 | 2113956B91 |
| C3250M1 | 2113956B91 |
| C3251M1 | 21667009166 |
| C3252M1 | 21667009166 |
| C3253M1 | 21667009166 |
| C3254M1 | 21667009166 |
| C3255M1 | 2113955D37 |
| C3256M1 | 2113956B91 |
| C3257M1 | 2113956B91 |
| C3258M1 | 2113945L49 |
| C4011M1 | 21667009166 |
| C4012M1 | 21667009166 |
| C4013M1 | 21667009166 |
| C4014M1 | 21667009166 |
| C4015M1 | 21667009166 |
| C4019M1 | 21667009166 |
| C4020M1 | 21667009166 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C4021M1 | 21667009166 |
| C4022M1 | 21667009166 |
| C4023M1 | 21667009166 |
| C4025M1 | 21667009166 |
| C4026M1 | 21667009166 |
| C4027M1 | 21667009166 |
| C4028M1 | 21667009166 |
| C4029M1 | 21667009166 |
| C4030M1 | 21667009166 |
| C4031M1 | 2113945Y02 |
| C4032M1 | 21667009166 |
| C4033M1 | 2113945Y02 |
| C4100M1 | 21667009166 |
| C4103M1 | 21667009166 |
| C4104M1 | 21667009166 |
| C4105M1 | 21667009166 |
| C4106M1 | 21667009166 |
| C4107M1 | 21667009166 |
| C4108M1 | 21667009166 |
| C4109M1 | 21667009166 |
| C4111M1 | 21667009166 |
| C4113M1 | 21667009166 |
| C4114M1 | 21667009166 |
| C4115M1 | 21667009166 |
| C4119M1 | 21667009166 |
| C4120M1 | 21667009166 |
| C4150M1 | 21667009166 |
| C4300M1 | 21667009166 |
| C4301M1 | 21667009166 |
| C4302M1 | 21667009166 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C4303M1 | 21667009166 |
| C4304M1 | 21667009166 |
| C4305M1 | 21667009376 |
| C4306M1 | 21667009381 |
| C4307M1 | 21667009166 |
| C4308M1 | 21667009166 |
| C4309M1 | 21667009166 |
| C4310M1 | 21667009166 |
| C4311M1 | 2113945Y02 |
| C4312M1 | 2113945Y02 |
| C4313M1 | 21667009166 |
| C4314M1 | 21667009166 |
| D1005M1 | 4813978C02 |
| D3104M1 | 4885489Y01 |
| D3160M1 | NOT PLACED |
| D3161M1 | NOT PLACED |
| E1000M1 | 7686949J15 |
| E1001M1 | 7686949J15 |
| E1002M1 | 7686949J15 |
| E1003M1 | 7686949J15 |
| E1004M1 | 7686949J15 |
| E1005M1 | 7686949J15 |
| E3100M1 | 24012102001 |
| E3101M1 | 2485410Y02 |
| E3103M1 | 2485410Y02 |
| E3104M1 | 7686949J22 |
| E3105M1 | 7686949J22 |
| E3106M1 | 7686949J22 |
| E3107M1 | 7686949J22 |
| E3108M1 | 7686949J22 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| E3109M1 | 7686949J22 |
| E3110M1 | 7686949J22 |
| E3111M1 | 7686949J22 |
| E3113M1 | 7686949J22 |
| E3201M1 | 7688697V14 |
| E3202M1 | 24012107027 |
| E3203M1 | 24012102001 |
| E3204M1 | 24012102001 |
| E4000M1 | 24012107027 |
| E4001M1 | 7688697V05 |
| E4002M1 | 24012107027 |
| E4003M1 | 24012107027 |
| E4004M1 | 24012107027 |
| E4005M1 | 24012107027 |
| E4100M1 | NOT PLACED |
| E4101M1 | NOT PLACED |
| E4102M1 | NOT PLACED |
| E4103M1 | NOT PLACED |
| E4300M1 | 24012107027 |
| FL4001M1 | 24012038001 |
| J4000M1 | 0915767H01 |
| J4001M1 | 0915556H01 |
| J4100M1 | 0966512A01 |
| L3100M1 | 24012091002 |
| P1000M1 | NOT PLACED |
| P1001M1 | NOT PLACED |
| Q1002M1 | 4815261H01 |
| Q1004M1 | 4815261H01 |
| Q1005M1 | 4815261H01 |
| Q3100M1 | 4815272H01 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| Q3102M1 | 4809939C47 |
| Q3103M1 | 4816134H01 |
| Q3104M1 | 4809939C47 |
| Q3160M1 | 4816134H01 |
| Q3161M1 | NOT PLACED |
| Q3162M1 | NOT PLACED |
| Q3163M1 | 4816134H01 |
| Q3201M1 | 4815272H01 |
| Q3205M1 | 4815270H01 |
| Q3206M1 | 4815270H01 |
| Q3209M1 | 4815263H01 |
| Q4100M1 | 4816023H01 |
| Q4101M1 | 4815261H01 |
| Q4102M1 | 4815263H01 |
| Q4105M1 | 48012271001 |
| Q4106M1 | 48012271001 |
| Q4112M1 | 48012271001 |
| Q4113M1 | 48012271001 |
| R1000M1 | 0613952R66 |
| R1001M1 | 0613952M66 |
| R1002M1 | 0613952R66 |
| R1003M1 | 0613952R66 |
| R1004M1 | 0613952R66 |
| R1005M1 | 0613952M66 |
| R1006M1 | 0613952R66 |
| R1007M1 | 0613952R66 |
| R1008M1 | 0613952R66 |
| R1009M1 | 0613952R66 |
| R1010M1 | 0613952M66 |
| R1011M1 | 0613952M66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R1012M1 | 0613952R66 |
| R1013M1 | 0613952M66 |
| R1014M1 | NOT PLACED |
| R1016M1 | NOT PLACED |
| R1018M1 | NOT PLACED |
| R1019M1 | 0613952R66 |
| R1020M1 | 0613952M66 |
| R1021M1 | 0613952Q73 |
| R1022M1 | NOT PLACED |
| R1023M1 | 0613952R66 |
| R1024M1 | NOT PLACED |
| R1025M1 | 0613952Q73 |
| R1026M1 | 0613952R66 |
| R1027M1 | NOT PLACED |
| R1028M1 | 0613952R66 |
| R1030M1 | NOT PLACED |
| R1031M1 | 0613952R66 |
| R1033M1 | 0613952Q73 |
| R1034M1 | 0613952R17 |
| R1035M1 | 0613952M66 |
| R1036M1 | 0613952M66 |
| R1038M1 | 0613952R66 |
| R1039M1 | 0613952R66 |
| R1040M1 | NOT PLACED |
| R1041M1 | 0613952R66 |
| R1042M1 | 0613952M66 |
| R1043M1 | 0613952R66 |
| R1044M1 | NOT PLACED |
| R1045M1 | 0613952M66 |
| R1046M1 | 0613952M66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R1048M1 | 0613952R66 |
| R1049M1 | 0613952Q73 |
| R1050M1 | 0613952Q73 |
| R1051M1 | 0613952K68 |
| R1052M1 | NOT PLACED |
| R1054M1 | 0613952R05 |
| R1056M1 | 0613952Q73 |
| R1057M1 | 0613952Q73 |
| R1059M1 | 0613952R66 |
| R1060M1 | 0613952R66 |
| R1062M1 | NOT PLACED |
| R1064M1 | NOT PLACED |
| R1065M1 | 0613952R66 |
| R1069M1 | 0613952M66 |
| R1076M1 | 0613952R66 |
| R1077M1 | 0613952R66 |
| R1090M1 | 0613952R05 |
| R1092M1 | 0613952M43 |
| R1093M1 | 0613952Q73 |
| R1107M1 | 0613952R66 |
| R1108M1 | 0613952R66 |
| R1110M1 | NOT PLACED |
| R1111M1 | NOT PLACED |
| R1112M1 | 0613952R66 |
| R1113M1 | 0613952R66 |
| R1114M1 | 0613952R66 |
| R1115M1 | 0613952R66 |
| R1116M1 | 0613952R66 |
| R1117M1 | 0613952R66 |
| R1118M1 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R1119M1 | 0613952R66 |
| R1120M1 | 0613952Q73 |
| R1122M1 | 0613952R01 |
| R1124M1 | 0613952Q88 |
| R1125M1 | 0613952R01 |
| R1126M1 | 0613952Q88 |
| R1127M1 | 0613952M66 |
| R1128M1 | NOT PLACED |
| R2000M1 | 0613952M66 |
| R2002M1 | 0613952M66 |
| R2003M1 | 0613952M30 |
| R2004M1 | 0613952R66 |
| R3101M1 | 0613952R66 |
| R3102M1 | 0613952M58 |
| R3103M1 | 0613952N62 |
| R3104M1 | 0613952M30 |
| R3105M1 | 0613952R01 |
| R3106M1 | 0613952M09 |
| R3107M1 | 0613952M85 |
| R3108M1 | 0613952R66 |
| R3109M1 | 0613952R66 |
| R3110M1 | 0613952N55 |
| R3111M1 | 0613952R32 |
| R3112M1 | 0613952P12 |
| R3113M1 | 0613952R17 |
| R3114M1 | 0613952N01 |
| R3115M1 | 0613952Z63 |
| R3116M1 | 0613952E83 |
| R3117M1 | 0613952R66 |
| R3118M1 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R3119M1 | 0613952Q73 |
| R3120M1 | 0613952R66 |
| R3121M1 | NOT PLACED |
| R3122M1 | 0613952M43 |
| R3123M1 | 0613952M54 |
| R3124M1 | 0613952R10 |
| R3125M1 | 0613952Q73 |
| R3126M1 | 0613952R66 |
| R3127M1 | 0613952M30 |
| R3128M1 | 0613952M10 |
| R3129M1 | 0613952M58 |
| R3130M1 | 0613952R25 |
| R3131M1 | NOT PLACED |
| R3132M1 | 0613952M66 |
| R3133M1 | 0613952R29 |
| R3134M1 | NOT PLACED |
| R3135M1 | 0613952R66 |
| R3137M1 | 0613952R01 |
| R3138M1 | 0613952R17 |
| R3139M1 | 0613952R66 |
| R3140M1 | NOT PLACED |
| R3141M1 | 0613959Y13 |
| R3142M1 | NOT PLACED |
| R3143M1 | NOT PLACED |
| R3144M1 | 0613952R01 |
| R3145M1 | 0613952H92 |
| R3146M1 | 0613952Z55 |
| R3147M1 | 0613952Z63 |
| R3148M1 | 0613952R66 |
| R3149M1 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R3150M1 | 0613952N62 |
| R3151M1 | 0613952R25 |
| R3152M1 | 0613952R01 |
| R3153M1 | 0613952R66 |
| R3154M1 | 0613952Q89 |
| R3155M1 | 0613952Q89 |
| R3157M1 | 0613952R01 |
| R3158M1 | NOT PLACED |
| R3159M1 | NOT PLACED |
| R3160M1 | 0613952Q89 |
| R3161M1 | 0613952Q73 |
| R3162M1 | 0613952Q85 |
| R3163M1 | 0613952R01 |
| R3164M1 | 0613952R01 |
| R3165M1 | NOT PLACED |
| R3166M1 | NOT PLACED |
| R3167M1 | 0613952R01 |
| R3168M1 | 0613952Q73 |
| R3169M1 | 0613952R01 |
| R3170M1 | NOT PLACED |
| R3171M1 | NOT PLACED |
| R3173M1 | NOT PLACED |
| R3175M1 | 0689774Y02 |
| R3176M1 | 0613952R01 |
| R3177M1 | 0613952R66 |
| R3180M1 | 0613952R01 |
| R3181M1 | 0613952Q91 |
| R3182M1 | 0613952R66 |
| R3200M1 | 0613952C44 |
| R3201M1 | 0613952Q49 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R3202M1 | 0613952C44 |
| R3203M1 | 0613952Q49 |
| R3204M1 | 0613952C44 |
| R3205M1 | 0613952C44 |
| R3206M1 | 0613952R01 |
| R3207M1 | 0613952R01 |
| R3208M1 | 0613952R01 |
| R3209M1 | 0613952N58 |
| R3210M1 | 0613952Q49 |
| R3211M1 | 0613952N30 |
| R3212M1 | 0613952R03 |
| R3213M1 | 0613952Q42 |
| R3214M1 | 0613952J25 |
| R3215M1 | 0613952R01 |
| R3216M1 | 0613952R01 |
| R3217M1 | 0613952Q73 |
| R3218M1 | 0613952R01 |
| R3219M1 | 0613952Q73 |
| R3220M1 | 0613952R01 |
| R3221M1 | NOT PLACED |
| R3222M1 | NOT PLACED |
| R3223M1 | 0613952R66 |
| R3224M1 | NOT PLACED |
| R3225M1 | NOT PLACED |
| R3226M1 | 0613952R01 |
| R3229M1 | 0613952Q67 |
| R3230M1 | 0613952R10 |
| R3231M1 | 0613952R10 |
| R3248M1 | 0613952R66 |
| R3249M1 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R3250M1 | 0613952R66 |
| R3251M1 | 0613952R66 |
| R3252M1 | 0613952R66 |
| R3253M1 | 0613952R66 |
| R3254M1 | 0613952R66 |
| R3255M1 | 0613952R66 |
| R3256M1 | 0613952M66 |
| R3257M1 | NOT PLACED |
| R3261M1 | 0613952R01 |
| R3262M1 | 0613952R10 |
| R3263M1 | NOT PLACED |
| R3264M1 | 0613952R01 |
| R3265M1 | 0613952M66 |
| R3266M1 | 0613952R01 |
| R3267M1 | NOT PLACED |
| R3268M1 | 0613952R01 |
| R3269M1 | 0613952M66 |
| R3274M1 | 0613952R10 |
| R3279M1 | NOT PLACED |
| R3280M1 | NOT PLACED |
| R3282M1 | 0613952R66 |
| R3283M1 | 0613952R01 |
| R3284M1 | 0613952R03 |
| R3285M1 | 0613952R01 |
| R3286M1 | 0613952Q73 |
| R3287M1 | 0613952Q63 |
| R3288M1 | 0613952R01 |
| R3289M1 | 0613952R01 |
| R3290M1 | 0613952R66 |
| R3296M1 | 0613952Q77 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R3297M1 | 0613952Q77 |
| R4001M1 | 0613952R66 |
| R4006M1 | 0613952Q37 |
| R4007M1 | 0613952Q37 |
| R4008M1 | 0613952Q73 |
| R4010M1 | 0613952R01 |
| R4013M1 | 0613952Q42 |
| R4015M1 | 0613952Q37 |
| R4019M1 | 0613952R01 |
| R4021M1 | 0613952R66 |
| R4024M1 | 0613952R66 |
| R4025M1 | 0613952Q58 |
| R4026M1 | 0613952R66 |
| R4027M1 | 0613952R66 |
| R4028M1 | 0613952Q58 |
| R4033M1 | 0613952R01 |
| R4034M1 | 0613952Q58 |
| R4037M1 | 0613952Q73 |
| R4038M1 | 0613952R01 |
| R4040M1 | NOT PLACED |
| R4041M1 | 0613952R01 |
| R4090M1 | 0613952R01 |
| R4091M1 | 0613952Q58 |
| R4092M1 | 0613952Q73 |
| R4093M1 | 0613952R01 |
| R4094M1 | 0613952R01 |
| R4096M1 | 0613952Q73 |
| R4097M1 | 0613952R01 |
| R4098M1 | 0613952R01 |
| R4099M1 | 0613952Q73 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R4100M1 | 0613952R01 |
| R4101M1 | 0613952Q77 |
| R4102M1 | 0613958H83 |
| R4103M1 | 0613952Q85 |
| R4104M1 | 0613952Q89 |
| R4105M1 | 0613952Q85 |
| R4106M1 | 0613952Q89 |
| R4107M1 | 0613952Q85 |
| R4108M1 | 0613952Q89 |
| R4109M1 | 0613952Q85 |
| R4110M1 | 0613952Q85 |
| R4111M1 | 0613952Q85 |
| R4112M1 | 0613952Q85 |
| R4113M1 | 0613952R01 |
| R4114M1 | 0613952R01 |
| R4115M1 | 0613952N58 |
| R4116M1 | 0613952Q89 |
| R4117M1 | 0613952R01 |
| R4118M1 | 0613952N58 |
| R4119M1 | 0613952R01 |
| R4120M1 | 0613952N58 |
| R4121M1 | 0613952R01 |
| R4122M1 | 0613952Q89 |
| R4123M1 | 0613952R01 |
| R4124M1 | NOT PLACED |
| R4125M1 | 0613952R66 |
| R4126M1 | NOT PLACED |
| R4127M1 | 0613952R66 |
| R4128M1 | NOT PLACED |
| R4129M1 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R4130M1 | 0613952N58 |
| R4131M1 | 0613952R66 |
| R4136M1 | NOT PLACED |
| R4302M1 | 0613952R66 |
| R4303M1 | 0613952R66 |
| R4304M1 | 0613952R66 |
| R4305M1 | 0613952R66 |
| R4306M1 | 0613952R66 |
| R4307M1 | 0613952R66 |
| R4310M1 | 0613952R66 |
| R4311M1 | 0613952R66 |
| R4312M1 | 0613952R66 |
| R4314M1 | 0613952R66 |
| SH3100M1 | NOT PLACED |
| U1000M1 | 5171320H01 |
| U1001M1 | 51012487001 |
| U1004M1 | 5178250A03 |
| U1009M1 | 5115001H02 |
| U1010M1 | 5171320H01 |
| U1011M1 | 51012283001 |
| U2000M1 | 51012239002 |
| U2001M1 | 51012058002 |
| U3100M1 | 0104039J08 |
| U3101M1 | 5114014A01 |
| U3102M1 | 51012069001 |
| U3103M1 | 51012142001 |
| U3104M1 | 5114610F01 |
| U3105M1 | 5114610F01 |
| U3106M1 | 51012140001 |
| U3107M1 | 51012140001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| U3108M1 | 5189092V21 |
| U3109M1 | 51012486002 |
| U3110M1 | 51007636001 |
| U3111M1 | NOT PLACED |
| U3112M1 | 5114004A35 |
| U3113M1 | NOT PLACED |
| U3115M1 | NOT PLACED |
| U3200M1 | 51012469001 |
| U3201M1 | 5114016A18 |
| U3202M1 | 5189139P01 |
| U3204M1 | 51012450001 |
| U4000M1 | 5115502H01 |
| U4001M1 | 5115502H01 |
| U4100M1 | 5189139P01 |
| U4300M1 | 51012082001 |
| U4301M1 | 51012082001 |
| VR3103M1 | 48012095001 |
| VR3104M1 | 48012095002 |
| VR3105M1 | 4813977M10 |
| VR3200M1 | 48012049001 |
| VR3201M1 | 4813977A48 |
| VR4000M1 | 4813977M13 |
| VR4001M1 | 4813977A48 |
| VR4002M1 | 48012049001 |
| VR4005M1 | NOT PLACED |
| VR4100M1 | 4813977A48 |
| VR4101M1 | 4813977A48 |
| VR4102M1 | 48012049001 |
| VR4103M1 | 4813977A48 |
| VR4107M1 | 4813977A48 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| VR4108M1 | 4813977A50 |
| VR4109M1 | 4813977A50 |
| VR4110M1 | 48012153001 |
| VR4111M1 | 4813977A48 |
| VR4112M1 | 4813977M47 |
| VR4150M1 | 4813977A48 |

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematics and overlays.

## Notes

# XiR™ M6660 Mobile Radios

Chapter 6

VHF (136–174 MHz)

1–25W

Service Information

Issue: June, 2013

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# Notes

# Section 1

# TROUBLESHOOTING CHARTS

## 1.0 Troubleshooting Flow Chart for Receiver (Sheet 1 of 4)

## 1.1 Troubleshooting Flow Chart for Receiver (Sheet 2 of 4)

# 1.2 Troubleshooting Flow Chart for Receiver (Sheet 3 of 4)

## 1.3 Troubleshooting Flow Chart for Receiver (Sheet 4 of 4)

# 2.0 Troubleshooting Flow Chart for 25W Transmitter

# 3.0 Troubleshooting Flow Chart for RFIC (Sheet 1 of 5)

## 3.1 Troubleshooting Flow Chart for RFIC (Sheet 2 of 5)

## 3.2 Troubleshooting Flow Chart for RFIC (Sheet 3 of 5)

## 3.3 Troubleshooting Flow Chart for RFIC (Sheet 4 of 5)

## 3.4 Troubleshooting Flow Chart for RFIC (Sheet 5 of 5)

# 4.0 Troubleshooting Flow Chart for Rx VCO (Sheet 1 of 2)

## 4.1 Troubleshooting Flow Chart for Rx VCO (Sheet 2 of 2)

# 5.0 Troubleshooting Flow Chart for Tx VCO (Sheet 1 of 2)

## 5.1 Troubleshooting Flow Chart for Tx VCO (Sheet 2 of 2)

# Section 2

# VHF PCB/SCHEMATICS/PARTS LIST

## 1.0 Allocation of Schematics and Circuit Boards

### 1.1 VHF 25W Circuits

The VHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This chapter shows the schematics for the VHF 25W circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts and the Parts List in this chapter show both the Controller and VHF 25W circuit components. The VHF 25W schematics and the related PCB and parts list are shown in the table below.

*Table 2-1 VHF 1–25W Schematic Diagrams and Parts List*

| | |
|---|---|
| **PCB :** | |
| **84012504002-B** Main Board Top Side | Page 2-3 |
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| **SCHEMATICS** | |
| **Overall** | **Page 2-5** |
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# Notes

## 2.0 VHF (136–174 MHz) 1–25W PCB/Schematics/Parts List

*VHF (136–174 MHz) 1–25W 84012504002-B Top Side*

***VHF (136–174 MHz) 1–25W 84012504002-B Bottom Side***

***VHF (136–174 MHz) 1–25W Overall Schematic Diagram***

*VHF (136–174 MHz) 1–25W Receiver Front-End Schematic Diagram*

***VHF (136–174 MHz) 1–25W Transmitter Power Amplifier Schematic Diagram (sheet 1 of 2)***

*VHF (136–174 MHz) 1–25W Transmitter Power Amplifier Schematic Diagram (sheet 2 of 2)*

*VHF (136–174 MHz) 1–25W Transmit/Receive Switch and Harmonic Filter Schematic Diagram*

*VHF (136–174 MHz) 1–25W Power Control Schematic Diagram*

***VHF (136–174 MHz) 1–25W Transmitter Power Amplifier DC Distribution Schematic Diagram***

*VHF (136–174 MHz) 1–25W RFIC Schematic Diagram*

***VHF (136–174 MHz) 1–25W Transmitter VCO Schematic Diagram***

***VHF (136–174 MHz) 1–25W Receiver VCO Schematic Diagram***

***VHF (136–174 MHz) 1–25W VCO Buffer Schematic Diagram***

***VHF PCB 84012504002-B***
***Parts List 1–25W***

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0001M2 | 21667009170 |
| C0002M2 | 21012044001 |
| C0003M2 | NOT PLACED |
| C0004M2 | 21012044001 |
| C0005M2 | 21012044001 |
| C0006M2 | 2113945C31 |
| C0007M2 | 21012044001 |
| C0009M2 | 2113945A10 |
| C0010M2 | 21667009166 |
| C0011M2 | 2113945C31 |
| C0012M2 | 21012044001 |
| C0013M2 | 2113945Y02 |
| C0014M2 | NOT PLACED |
| C0015M2 | 21667009166 |
| C0016M2 | NOT PLACED |
| C0017M2 | 2113945Y02 |
| C0018M2 | 2113946B01 |
| C0019M2 | 2113945Y02 |
| C0020M2 | 21667009166 |
| C0021M2 | 2113945Y02 |
| C0022M2 | NOT PLACED |
| C0023M2 | 2113945A03 |
| C0024M2 | 21012129001 |
| C0025M2 | 2113945A10 |
| C0026M2 | 21667009174 |
| C0027M2 | 2113946B01 |
| C0028M2 | 2113945Y02 |
| C0029M2 | 2113946B01 |
| C0030M2 | 2113946B01 |
| C0031M2 | 2113946B01 |
| C0032M2 | 2113945A10 |
| C0033M2 | 21667009166 |
| C0034M2 | 21012044001 |
| C0035M2 | 2113945A10 |
| C0036M2 | 21667009166 |
| C0037M2 | 2113945A10 |
| C0039M2 | 2113945Y02 |
| C0042M2 | 2113945A03 |
| C0043M2 | 21012044001 |
| C0044M2 | 2113955D45 |
| C0045M2 | 2113945Y02 |
| C0046M2 | 21667009166 |
| C0049M2 | 2113945B02 |
| C0053M2 | 2113945Y02 |
| C0054M2 | 21667009166 |
| C0055M2 | 2113955D37 |
| C0056M2 | 2113945Y02 |
| C0059M2 | 2113945A10 |
| C0060M2 | 21012096001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0061M2 | 2113945Y02 |
| C0064M2 | 21012096001 |
| C0065M2 | 2113945Y02 |
| C0066M2 | 2113945B02 |
| C0067M2 | 2113945Y02 |
| C0068M2 | 2113955D37 |
| C0070M2 | 2113955D37 |
| C0071M2 | 2113955D37 |
| C0072M2 | 2113945A10 |
| C0073M2 | 21667009166 |
| C0074M2 | 21667009166 |
| C0075M2 | 2113946S35 |
| C0076M2 | 2113946S35 |
| C0078M2 | 21667009372 |
| C0080M2 | 2113945B02 |
| C0081M2 | 2113945B02 |
| C0082M2 | 2113945B02 |
| C0083M2 | 2113945B02 |
| C0085M2 | 21667009166 |
| C0086M2 | 2113945C31 |
| C0089M2 | 2113945A10 |
| C0091M2 | 21667009365 |
| C0092M2 | 2113945A10 |
| C0093M2 | NOT PLACED |
| C0094M2 | 2113945Y02 |
| C0095M2 | 2113945A13 |
| C0096M2 | 2113945B02 |
| C0097M2 | 2113945B02 |
| C0098M2 | 21667009166 |
| C0099M2 | 2113945Y02 |
| C0100M2 | 2113945Y02 |
| C0101M2 | 2113945A10 |
| C0102M2 | 2113945A10 |
| C0103M2 | 2113945A10 |
| C0104M2 | 2113945A10 |
| C0105M2 | NOT PLACED |
| C0111M2 | 2113945Y02 |
| C0120M2 | 2113945A10 |
| C0124M2 | 21667009166 |
| C0134M2 | 2113945A10 |
| C0135M2 | 2113945A10 |
| C0136M2 | 2113945A10 |
| C0137M2 | 2113945Y02 |
| C0138M2 | 2113946B01 |
| C0139M2 | NOT PLACED |
| C0140M2 | NOT PLACED |
| C0141M2 | 2113946B01 |
| C0143M2 | 2113945Y02 |
| C0144M2 | 2113945Y02 |
| C0145M2 | 2113945A10 |
| C0146M2 | 2113945A10 |
| C0147M2 | 2113945A10 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0149M2 | 2113945A10 |
| C0150M2 | 2113945A10 |
| C0200M7 | 2113945A10 |
| C0201M7 | 21667009372 |
| C0202M7 | 2113945A06 |
| C0203M7 | 21667009297 |
| C0204M7 | 21667009366 |
| C0205M7 | NOT PLACED |
| C0206M7 | 21667009355 |
| C0207M7 | 21667009355 |
| C0208M7 | 2113945A10 |
| C0212M7 | NOT PLACED |
| C0215M7 | 21667009366 |
| C0216M7 | 21667009315 |
| C0217M7 | 21667009204 |
| C0221M7 | 21667009371 |
| C0222M7 | 21667009374 |
| C0225M7 | 2113945Y02 |
| C0226M7 | 21667009372 |
| C0229M7 | 2113945A10 |
| C0231M7 | 2113945A10 |
| C0233M7 | 21667009284 |
| C0237M7 | 2113945A06 |
| C0238M7 | 2113945Y02 |
| C0239M7 | 2113945Y02 |
| C0240M7 | 2113945A06 |
| C0241M7 | 2113945A06 |
| C0242M7 | 2113945A10 |
| C0243M7 | 2113945A10 |
| C0244M7 | 21667009339 |
| C0245M7 | 21667009339 |
| C0246M7 | 2113945A10 |
| C0247M7 | 2113945A06 |
| C0248M7 | NOT PLACED |
| C0249M7 | 2113945A06 |
| C0252M7 | 21667009294 |
| C0256M7 | 21667009320 |
| C0257M7 | 21667009364 |
| C0259M7 | 2113945Y02 |
| C0263M7 | 2113945A06 |
| C0265M7 | 2113945A06 |
| C0267M7 | 21667009284 |
| C0269M7 | 2113945A10 |
| C0270M7 | 2113945Y02 |
| C0271M7 | 2113945A10 |
| C0276M7 | 21667009371 |
| C0300M7 | 21667009315 |
| C0301M7 | 2113945A06 |
| C0302M7 | 21667009300 |
| C0304M7 | 21667009392 |
| C0305M7 | 2113945Y02 |
| C0306M7 | 2113945A09 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0307M7 | 2113945A02 |
| C0308M7 | NOT PLACED |
| C0309M7 | 21667009368 |
| C0310M7 | NOT PLACED |
| C0311M7 | 21667009371 |
| C0400M4 | NOT PLACED |
| C0401M4 | NOT PLACED |
| C0402M4 | 2113945A10 |
| C0403M4 | 21667009279 |
| C0404M4 | 21667009375 |
| C0405M4 | 21667009279 |
| C0406M4 | 21667009279 |
| C0407M4 | 21667009375 |
| C0408M4 | 2113945C31 |
| C0409M4 | 2113945C31 |
| C0410M4 | 2113945A10 |
| C0411M4 | 2113945A10 |
| C0412M4 | 2113956A51 |
| C0413M4 | 2113945A10 |
| C0414M4 | 21667009388 |
| C0415M4 | 21667009378 |
| C0416M4 | 2113945C31 |
| C0417M4 | 21667009388 |
| C0418M4 | 2113945A10 |
| C0419M4 | NOT PLACED |
| C0420M4 | 2113945A10 |
| C0421M4 | 21667009374 |
| C0422M4 | 2113945A10 |
| C0423M4 | 21667009279 |
| C0424M4 | 21667009374 |
| C0425M4 | 2113945A10 |
| C0427M4 | 2113945A10 |
| C0428M4 | 21667009371 |
| C0429M4 | 21667009386 |
| C0430M4 | 21667009380 |
| C0431M4 | 2113945A10 |
| C0432M4 | 2113945A10 |
| C0433M4 | 2113945A10 |
| C0434M4 | 21667009182 |
| C0435M4 | 21667009370 |
| C0436M4 | 21667009005 |
| C0437M4 | 2113945A10 |
| C0438M4 | 21667009367 |
| C0439M4 | 2113945A10 |
| C0440M4 | 2113945A10 |
| C0441M4 | 21667009367 |
| C0442M4 | NOT PLACED |
| C0452M4 | 21667009374 |
| C0453M4 | 21667009374 |
| C0458M4 | 2113956B54 |
| C0460M4 | 21667009386 |
| C0463M4 | 2113945C31 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0464M4 | 21667009380 |
| C0465M4 | 21667009393 |
| C0466M4 | 2113945A10 |
| C0467M4 | 2113945C31 |
| C0469M4 | 21667009393 |
| C0700M5 | 2113945C31 |
| C0701M5 | 21667009174 |
| C0702M5 | 2113944C34 |
| C0703M5 | 2113944C51 |
| C0704M5 | 21667009125 |
| C0705M5 | 21667009106 |
| C0706M5 | NOT PLACED |
| C0707M5 | 2113945C31 |
| C0708M5 | 21667011030 |
| C0709M5 | 2113945C04 |
| C0710M5 | 21667009174 |
| C0711M5 | 2113944C06 |
| C0712M5 | 2113945L49 |
| C0713M5 | 21667009174 |
| C0714M5 | NOT PLACED |
| C0715M5 | 21667009164 |
| C0716M5 | 2113944C51 |
| C0717M5 | 2113944C35 |
| C0718M5 | 21667007042 |
| C0719M5 | 21667009373 |
| C0720M5 | 2113944C51 |
| C0721M5 | 2113945L37 |
| C0722M5 | 2113945A09 |
| C0723M5 | NOT PLACED |
| C0724M5 | 2113944C84 |
| C0725M5 | NOT PLACED |
| C0726M5 | 2113944C51 |
| C0727M5 | NOT PLACED |
| C0728M5 | NOT PLACED |
| C0729M5 | 2113944C46 |
| C0730M5 | 2113945L49 |
| C0731M5 | 21667009174 |
| C0732M5 | 2113945A09 |
| C0733M5 | 2113944C45 |
| C0734M5 | 2113944C51 |
| C0735M5 | 21667007030 |
| C0736M5 | NOT PLACED |
| C0737M5 | 2113944C04 |
| C0738M5 | 2113944C46 |
| C0739M5 | NOT PLACED |
| C0740M5 | 2113945C25 |
| C0741M5 | NOT PLACED |
| C0742M5 | 2113944C30 |
| C0743M5 | NOT PLACED |
| C0744M5 | NOT PLACED |
| C0745M5 | 21009337414 |
| C0746M5 | 2113944C06 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0747M5 | 0613952H42 |
| C0748M5 | 2113945C31 |
| C0749M5 | 2113944F05 |
| C0750M5 | 21667007042 |
| C0751M5 | 21667007042 |
| C0752M5 | 21667007066 |
| C0753M5 | 21667007043 |
| C0754M5 | NOT PLACED |
| C0755M5 | 2113944C36 |
| C0758M5 | 21667007043 |
| C0759M5 | 21667007042 |
| C0760M5 | 2113944C51 |
| C0761M5 | 2113944C45 |
| C0762M5 | 21667007042 |
| C0764M5 | 2113944C51 |
| C0765M5 | NOT PLACED |
| C0767M5 | NOT PLACED |
| C0768M5 | 21667007029 |
| C0770M5 | 21667007030 |
| C0771M5 | 21667007042 |
| C0773M5 | NOT PLACED |
| C0774M5 | NOT PLACED |
| C0775M5 | 2113944C06 |
| C0780M5 | 2113944C06 |
| C0781M5 | NOT PLACED |
| C0783M5 | NOT PLACED |
| C0784M5 | NOT PLACED |
| C0786M5 | NOT PLACED |
| C0787M5 | NOT PLACED |
| C0788M5 | NOT PLACED |
| C0789M5 | NOT PLACED |
| C0793M5 | 21667007045 |
| C0794M5 | 21667007047 |
| C0797M5 | NOT PLACED |
| C0803M5 | NOT PLACED |
| C0814M5 | 2113944F67 |
| C0818M5 | NOT PLACED |
| C0824M5 | 21667007012 |
| C0840M5 | 21667007034 |
| C0841M5 | 21667007034 |
| C0842M5 | 21667007034 |
| C0850M5 | 21667007040 |
| C0851M5 | 21667007040 |
| C0852M5 | 21667007040 |
| C0853M5 | 21667007023 |
| C0856M5 | 21667007030 |
| C0857M5 | 21667007031 |
| C0858M5 | 21667007031 |
| C0859M5 | NOT PLACED |
| C0860M5 | NOT PLACED |
| C0861M5 | 21667007031 |
| C0862M5 | 21667007031 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0863M5 | 21667007030 |
| C0866M5 | NOT PLACED |
| C0868M5 | 21667007023 |
| C0869M5 | 21667007045 |
| C0870M5 | 21667007045 |
| C0871M5 | 21667007045 |
| C0872M5 | NOT PLACED |
| C0873M5 | 21667007017 |
| C0875M5 | 2113944C47 |
| C0876M5 | 2113944C33 |
| C0877M5 | 2113944C06 |
| C0878M5 | NOT PLACED |
| C0879M5 | 2113944C06 |
| C0880M5 | 2113944C36 |
| C0881M5 | 2113944F05 |
| C0882M5 | 2113944C51 |
| C0883M5 | 21667007050 |
| C0884M5 | 21667007050 |
| C0885M5 | NOT PLACED |
| C0888M5 | NOT PLACED |
| C0890M5 | NOT PLACED |
| C0891M5 | 21667007029 |
| C0893M5 | 21667007029 |
| C0900M5 | NOT PLACED |
| C0901M5 | NOT PLACED |
| C0902M5 | 2113944C51 |
| C0905M5 | 2113945C31 |
| C0906M5 | 2113945A10 |
| C0907M5 | 2113945L41 |
| C0908M5 | 21667009174 |
| C0909M5 | 21667009174 |
| C0910M5 | 21667009174 |
| C0911M5 | 2113944C02 |
| C0912M5 | 21667009174 |
| C0913M5 | 21667009174 |
| C0916M5 | NOT PLACED |
| C0917M5 | 21667009174 |
| C0918M5 | 21667009174 |
| C0919M5 | 21667009174 |
| C0921M5 | 2113944C51 |
| C0922M5 | 2113945C31 |
| C0923M5 | 2113944C02 |
| C0924M5 | 21667009174 |
| C0925M5 | 2113946B04 |
| C0926M5 | 2113944C02 |
| C0950M5 | 2113944C51 |
| C0951M5 | 2113944C30 |
| C0952M5 | 2113944C51 |
| C0953M5 | 2113944C51 |
| C0954M5 | 2113944M27 |
| C0955M5 | 2113944C51 |
| C0956M5 | 2113944C01 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0957M5 | 21667009172 |
| C3000M5 | 2113944C38 |
| C3001M5 | 2113944C06 |
| C3002M5 | 2113944C06 |
| C3003M5 | 2113945C31 |
| C3004M5 | 2113945C02 |
| C3005M5 | 2113945C02 |
| C3008M5 | 2113944C51 |
| C3009M5 | 2113945C31 |
| C3010M5 | 2113944C46 |
| C3011M5 | 2113945G53 |
| C3012M5 | 2113946J04 |
| C3013M5 | 2113945C31 |
| C3014M5 | 21009337414 |
| C3015M5 | 2113946G01 |
| C3016M5 | 2113945C31 |
| C3019M5 | NOT PLACED |
| C3020M5 | 2113945C26 |
| C3021M5 | 2113944C06 |
| C3022M5 | 2113945A10 |
| C3029M5 | NOT PLACED |
| C3038M5 | 21667009169 |
| C3041M5 | 21667009169 |
| C3042M5 | 21667009169 |
| C3044M5 | 21667009169 |
| C3046M5 | 21667009174 |
| C3047M5 | 21667009174 |
| C3048M5 | 21667009174 |
| C3049M5 | 21667009174 |
| C3050M5 | 21667009169 |
| C3051M5 | 21667009174 |
| D0000M2 | 4815011H01 |
| D0001M2 | 4815011H01 |
| D0401M4 | 4813974A19 |
| D0402M4 | 4813974A19 |
| D0875M5 | 48012160001 |
| D0876M5 | 4886622Y06 |
| D0877M5 | 48012160001 |
| D0950M5 | 4813974A21 |
| D0951M5 | 4813974A21 |
| D0960M5 | 48012181001 |
| D3000M5 | 4813978P07 |
| E0000M2 | 24012107027 |
| E0001M2 | 24012107027 |
| E0004M2 | 24012107027 |
| E0005M2 | 24012107027 |
| E0006M2 | 24012107027 |
| E0007M2 | 24012107027 |
| E0008M2 | 24012107027 |
| E0009M2 | 24012107027 |
| E0010M2 | 24012107027 |
| E0300M7 | 24012107027 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| E0301M7 | 24012107027 |
| E0400M4 | 2471132D16 |
| E0401M4 | 2471132D16 |
| E0402M4 | 2471132D16 |
| E0403M4 | 24012107027 |
| E0404M4 | 2471132D16 |
| E0405M4 | 2471132D16 |
| E0700M5 | 24012102001 |
| E0701M5 | 24012102001 |
| E0703M5 | 24012102001 |
| E3000M5 | 24012102001 |
| J0700M5 | 09009348001 |
| L0000M2 | 24012161001 |
| L0001M2 | 24667008014 |
| L0200M7 | 24667000031 |
| L0201M7 | 24667008024 |
| L0202M7 | 24667008013 |
| L0204M7 | 24667005040 |
| L0205M7 | 24667008018 |
| L0206M7 | 24667005040 |
| L0208M7 | 24667000031 |
| L0210M7 | 24009342045 |
| L0211M7 | 2414015C11 |
| L0212M7 | 24667008032 |
| L0214M7 | 24009343013 |
| L0216M7 | 24009343007 |
| L0218M7 | 24667008032 |
| L0220M7 | 24667008032 |
| L0222M7 | 24667008032 |
| L0224M7 | 24667008032 |
| L0226M7 | 24667008017 |
| L0300M7 | 24667008017 |
| L0301M7 | 24667008032 |
| L0302M7 | 24667008032 |
| L0303M7 | 24667008013 |
| L0304M7 | 24667008019 |
| L0305M7 | 24667008016 |
| L0400M4 | 24667008018 |
| L0401M4 | 2414015C09 |
| L0402M4 | 2475122C33 |
| L0403M4 | 24667005043 |
| L0404M4 | 24667005043 |
| L0405M4 | 24009344125 |
| L0406M4 | 2414015C09 |
| L0407M4 | 24667008025 |
| L0408M4 | 24009344035 |
| L0409M4 | 24667008025 |
| L0410M4 | 24667008018 |
| L0413M4 | 2475122C42 |
| L0414M4 | 2475122C42 |
| L0700M5 | 24667008020 |
| L0701M5 | 24667008018 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| L0702M5 | 24667008028 |
| L0703M5 | 24667008020 |
| L0704M5 | 24667008028 |
| L0705M5 | 24667008025 |
| L0706M5 | 24012145001 |
| L0707M5 | 24667008031 |
| L0708M5 | 2479990G01 |
| L0709M5 | 24667008022 |
| L0710M5 | 2460591C53 |
| L0714M5 | 2460591B73 |
| L0715M5 | 2460591A77 |
| L0717M5 | 24667008016 |
| L0718M5 | 24667008018 |
| L0719M5 | 24667008025 |
| L0729M5 | 2414032B60 |
| L0850M5 | 24012145004 |
| L0852M5 | 24012145004 |
| L0854M5 | 24012145004 |
| L0857M5 | 2415385H02 |
| L0858M5 | 2415385H07 |
| L0860M5 | 2416077H16 |
| L0875M5 | 24012145004 |
| L0877M5 | 24009343030 |
| L0878M5 | NOT PLACED |
| L0879M5 | 24667008033 |
| L0880M5 | 24009343030 |
| L0885M5 | 2414032B50 |
| L0900M5 | 24667000031 |
| L0901M5 | 24009344018 |
| L0902M5 | 24667000031 |
| L0951M5 | NOT PLACED |
| L0952M5 | NOT PLACED |
| M0700M5 | 2686201B02 |
| M3000M5 | 0289511U04 |
| P3000M5 | NOT PLACED |
| Q0000M2 | 4813973A13 |
| Q0001M2 | 4816134H01 |
| Q0002M2 | 4813970A59 |
| Q0200M7 | 48012195001 |
| Q0203M7 | 4815272H01 |
| Q0204M7 | 48012195001 |
| Q0205M7 | 4816134H01 |
| Q0206M7 | 4815272H01 |
| Q0207M7 | 4816134H01 |
| Q0300M7 | 4802197J95 |
| Q0400M4 | 4815270H01 |
| Q0401M4 | 4815267H01 |
| Q0402M4 | 48012201001 |
| Q0403M4 | NOT PLACED |
| Q0404M4 | 4816134H01 |
| Q0405M4 | 4816134H01 |
| Q0406M4 | 4815066H01 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| Q0407M4 | 4815272H01 |
| Q0700M5 | 4816547H01 |
| Q0701M5 | 4816013H01 |
| Q0702M5 | 48012067002 |
| Q0703M5 | 4802246J29 |
| Q0704M5 | 4816548H01 |
| Q0875M5 | 4813970A62 |
| Q0876M5 | 4816134H01 |
| Q0900M5 | 4815272H01 |
| Q3000M5 | 0105959T72 |
| Q3001M5 | 0105959T72 |
| Q3002M5 | 4813973B01 |
| R0000M2 | 0613952R66 |
| R0001M2 | 0613952R66 |
| R0006M2 | 0613952Q25 |
| R0007M2 | 0613952Q46 |
| R0008M2 | 0613952R01 |
| R0009M2 | 0613952Q51 |
| R0010M2 | 0613952R66 |
| R0011M2 | 0613952Q35 |
| R0012M2 | 0613952Q81 |
| R0013M2 | 0613952Q35 |
| R0014M2 | 0613952R66 |
| R0015M2 | 0613952R66 |
| R0019M2 | 0613952R01 |
| R0022M2 | 0613952R66 |
| R0025M2 | 0613952R66 |
| R0029M2 | 0613952Q25 |
| R0030M2 | 0613952R66 |
| R0044M2 | 0613952R25 |
| R0054M2 | 0613952M25 |
| R0200M7 | 0613952R66 |
| R0202M7 | 0613952Q42 |
| R0203M7 | 0613952Q32 |
| R0204M7 | NOT PLACED |
| R0205M7 | 0613952H37 |
| R0206M7 | NOT PLACED |
| R0207M7 | 0613952Q86 |
| R0208M7 | 0613952G67 |
| R0209M7 | 0613952Q85 |
| R0211M7 | 0613952Q18 |
| R0213M7 | 0613952Q67 |
| R0215M7 | 0613952Q67 |
| R0217M7 | 0613952Q49 |
| R0220M7 | 0613952R66 |
| R0221M7 | 0613952R66 |
| R0222M7 | 0613952Q78 |
| R0223M7 | 0613952Q73 |
| R0224M7 | 0613952Q73 |
| R0225M7 | 0613952Q73 |
| R0226M7 | NOT PLACED |
| R0227M7 | 0613952G67 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0228M7 | 0613952Q67 |
| R0230M7 | 0613952Q67 |
| R0232M7 | 0613952Q49 |
| R0233M7 | 0613952R66 |
| R0300M7 | 0613952Q66 |
| R0301M7 | 0613952Q25 |
| R0302M7 | 0613952Q66 |
| R0303M7 | 0613952Q94 |
| R0304M7 | 0613952Q89 |
| R0305M7 | 0613952Q33 |
| R0306M7 | 0613952Q49 |
| R0307M7 | 0613952H46 |
| R0308M7 | 0613952Q49 |
| R0309M7 | 0613952Q42 |
| R0400M4 | 0613952Q38 |
| R0401M4 | 0613958H68 |
| R0402M4 | 0613952R25 |
| R0403M4 | 0613952R01 |
| R0404M4 | 0613952R25 |
| R0405M4 | 0613952Q72 |
| R0406M4 | 0613952Z43 |
| R0407M4 | 0613952Q73 |
| R0408M4 | 0613952Q88 |
| R0409M4 | NOT PLACED |
| R0410M4 | 0613952R01 |
| R0411M4 | 0613952Q69 |
| R0412M4 | 0613952Q67 |
| R0413M4 | 0613952Q75 |
| R0414M4 | 0613958H69 |
| R0415M4 | 0613952Q69 |
| R0416M4 | 0613952R25 |
| R0417M4 | 0613952Q69 |
| R0418M4 | 0613952H73 |
| R0419M4 | 0613952Q53 |
| R0420M4 | 0613952H73 |
| R0421M4 | 0613952Q69 |
| R0422M4 | 0613952Q53 |
| R0423M4 | 0613952Q77 |
| R0424M4 | 0613952Q77 |
| R0425M4 | 0613952N37 |
| R0426M4 | 0613958H69 |
| R0427M4 | 0613952N01 |
| R0428M4 | NOT PLACED |
| R0429M4 | 0613952R66 |
| R0430M4 | 0613952N46 |
| R0431M4 | 0613952Z48 |
| R0432M4 | 0613952Q67 |
| R0433M4 | NOT PLACED |
| R0434M4 | 0613952Q23 |
| R0435M4 | 0613952Q67 |
| R0436M4 | 0613952R66 |
| R0437M4 | NOT PLACED |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0438M4 | 0613952R66 |
| R0439M4 | NOT PLACED |
| R0440M4 | 0613952L46 |
| R0441M4 | NOT PLACED |
| R0442M4 | 0613952K25 |
| R0443M4 | 0613952L46 |
| R0444M4 | 0613952Q78 |
| R0445M4 | 0613952Q46 |
| R0448M4 | 0613952Q35 |
| R0700M5 | 0613952J01 |
| R0701M5 | 0613952G67 |
| R0702M5 | 0613952H49 |
| R0703M5 | 0613952J01 |
| R0704M5 | 0613952J01 |
| R0705M5 | 0613952H50 |
| R0706M5 | 0613952H44 |
| R0707M5 | 0613952H50 |
| R0708M5 | NOT PLACED |
| R0709M5 | 0613958S49 |
| R0710M5 | 0613959Q42 |
| R0711M5 | 0613958S44 |
| R0712M5 | 0613958S44 |
| R0713M5 | 0613958S49 |
| R0714M5 | 0613952H42 |
| R0715M5 | 0613952H42 |
| R0716M5 | 0613952H42 |
| R0717M5 | 0613952H42 |
| R0718M5 | 0613952H96 |
| R0719M5 | 0613952H89 |
| R0720M5 | 0613952J01 |
| R0721M5 | 0613952G67 |
| R0722M5 | NOT PLACED |
| R0723M5 | 0613952G67 |
| R0724M5 | 0613958S49 |
| R0725M5 | 0613958S49 |
| R0726M5 | 0613958S49 |
| R0727M5 | 0613952N43 |
| R0728M5 | 0613958J49 |
| R0729M5 | 0613958J49 |
| R0730M5 | 0613958S49 |
| R0731M5 | 0613958S49 |
| R0732M5 | 0613958S49 |
| R0733M5 | 0613958S49 |
| R0734M5 | 0613958S49 |
| R0735M5 | NOT PLACED |
| R0736M5 | 0613959Q25 |
| R0739M5 | 0613952H73 |
| R0742M5 | NOT PLACED |
| R0743M5 | 0613952J17 |
| R0744M5 | NOT PLACED |
| R0745M5 | 0613952R66 |
| R0746M5 | 0613952J25 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0747M5 | NOT PLACED |
| R0749M5 | 0613952H41 |
| R0750M5 | 0613952H37 |
| R0759M5 | 0613959H12 |
| R0849M5 | NOT PLACED |
| R0876M5 | 0613958S73 |
| R0877M5 | 0613959Y37 |
| R0878M5 | 0613959Y37 |
| R0879M5 | 0613952J25 |
| R0882M5 | 0613952G67 |
| R0883M5 | 0613952G67 |
| R0902M5 | 0613952R66 |
| R0903M5 | 0613952N01 |
| R0904M5 | 0613952R66 |
| R0905M5 | 0613952H42 |
| R0906M5 | 0613958H49 |
| R0907M5 | 0613958H56 |
| R0908M5 | 0613958H32 |
| R0909M5 | 0613952R66 |
| R0910M5 | 0613952H91 |
| R0911M5 | 0613952H85 |
| R0912M5 | 0613958H49 |
| R0913M5 | 0613952M51 |
| R0914M5 | 0613952M71 |
| R0915M5 | NOT PLACED |
| R0916M5 | 0613952R66 |
| R0917M5 | 0613952P01 |
| R0919M5 | 0613952P01 |
| R0920M5 | 0613952N01 |
| R0921M5 | 0613952N01 |
| R0922M5 | 0613952R66 |
| R0923M5 | 0613952M43 |
| R0924M5 | 0613952N09 |
| R0928M5 | 0613952P30 |
| R0929M5 | 0613952N81 |
| R0930M5 | 0613952Z61 |
| R0931M5 | 0613952Z26 |
| R0932M5 | 0613952N51 |
| R0933M5 | 0613952M66 |
| R0934M5 | 0613952J17 |
| R0935M5 | 0613952H91 |
| R0936M5 | 0613952H91 |
| R0937M5 | NOT PLACED |
| R0938M5 | 0613952R66 |
| R0939M5 | 0613952R66 |
| R0940M5 | 0613952Z76 |
| R0949M5 | 0613952G67 |
| R0950M5 | 0613952G67 |
| R0951M5 | 0613958H55 |
| R0952M5 | 0613958H53 |
| R0953M5 | 0613952G67 |
| R0954M5 | 0613952H39 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0955M5 | 0613952H39 |
| R0956M5 | 0613952G67 |
| R0957M5 | 0613958H53 |
| R0958M5 | 0613958H53 |
| R0959M5 | 0613952R66 |
| R0960M5 | 0613952N58 |
| R0961M5 | 0613952N58 |
| R0962M5 | 0613952N58 |
| R0965M5 | 0613952P01 |
| R3000M5 | 0613952H60 |
| R3001M5 | 0615871H01 |
| R3002M5 | 0615871H01 |
| R3003M5 | 0615871H01 |
| R3004M5 | 0615871H01 |
| R3005M5 | 0613952H25 |
| R3006M5 | 0613952H25 |
| R3007M5 | 0613952M30 |
| R3008M5 | 0613952G67 |
| R3009M5 | 0613952M43 |
| R3010M5 | 0613952G67 |
| R3011M5 | 0613959Q60 |
| R3012M5 | 0613959Q60 |
| R3013M5 | 0613952R01 |
| R3014M5 | 0613952R01 |
| R3015M5 | 0615871H01 |
| R3018M5 | 0613952H73 |
| R3019M5 | 0613952H60 |
| R3020M5 | 0613952G67 |
| R3021M5 | 0613952R25 |
| RT0900M5 | 0615585H01 |
| SH0000M2 | 26012095001 |
| SH0001M2 | 26012095001 |
| SH0003M2 | 26012094001 |
| SH0200M7 | 26012231001 |
| SH0201M7 | 26012231001 |
| SH0400M4 | 26012231001 |
| SH0401M4 | 26012231001 |
| SH0850M5 | 26012100001 |
| SH0900M5 | 2686425Z02 |
| SH0901M5 | 2686425Z02 |
| T0000M2 | 25012016001 |
| U0000M2 | 51009686002 |
| U0200M7 | 5186310Y39 |
| U0400M4 | 5180390L83 |
| U0401M4 | 5186310Y39 |
| U0402M4 | 5186310Y39 |
| U0901M5 | 5180390L83 |
| U0902M5 | 51012221001 |
| U0903M5 | 5115022H01 |
| U0904M5 | 5109731C48 |
| U3000M5 | 5116525H01 |
| U3001M5 | 4813973M07 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| U3002M5 | NOT PLACED |
| VR0200M7 | 48012260001 |
| VR0201M7 | 4805656W87 |
| VR0205M7 | 4805656W87 |
| VR0206M7 | 48012260001 |
| VR0210M7 | 4805656W87 |
| VR0211M7 | 4805656W87 |
| VR0214M7 | 4805656W87 |
| VR0215M7 | 4805656W87 |
| VR0400M4 | 4805656W87 |
| VR0401M4 | 4805656W87 |
| VR0402M4 | 4805656W87 |
| VR0403M4 | 4805656W87 |
| VR3000M5 | 48012202001 |
| VR3002M5 | 4813977M10 |
| Y0000M2 | 4875185M05 |

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematic and overlays.

# XiR™ M6660 Mobile Radios

Chapter 7

VHF (136–174 MHz)

25–45W

Service Information

Issue: June, 2013

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# Notes

# Section 1

# TROUBLESHOOTING CHARTS

## 1.0 Troubleshooting Flow Chart for Receiver (Sheet 1 of 4)

## 1.1 Troubleshooting Flow Chart for Receiver (Sheet 2 of 4)

# 1.2 Troubleshooting Flow Chart for Receiver (Sheet 3 of 4)

## 1.3 Troubleshooting Flow Chart for Receiver (Sheet 4 of 4)

# 2.0 Troubleshooting Flow Chart for 45W Transmitter

# 3.0 Troubleshooting Flow Chart for RFIC (Sheet 1 of 5)

## 3.1 Troubleshooting Flow Chart for RFIC (Sheet 2 of 5)

## 3.2 Troubleshooting Flow Chart for RFIC (Sheet 3 of 5)

## 3.3 Troubleshooting Flow Chart for RFIC (Sheet 4 of 5)

## 3.4 Troubleshooting Flow Chart for RFIC (Sheet 5 of 5)

# 4.0 Troubleshooting Flow Chart for Rx VCO (Sheet 1 of 2)

## 4.1 Troubleshooting Flow Chart for Rx VCO (Sheet 2 of 2)

# 5.0 Troubleshooting Flow Chart for Tx VCO (Sheet 1 of 2)

## 5.1 Troubleshooting Flow Chart for Tx VCO (Sheet 2 of 2)

# Section 2

# VHF PCB/SCHEMATICS/PARTS LISTS

## 1.0 Allocation of Schematics and Circuit Boards

### 1.1 VHF 45W Circuits

The VHF circuits are contained on the Printed Circuit Board (PCB) which also contains the Controller circuits. This chapter shows the schematics for the VHF 45W circuits only, refer to the Controller section for details of the related Controller circuits. The PCB component layouts and the Parts List in this chapter show both the Controller and VHF 45W circuit components. The VHF 45W schematics and the related PCB and parts list are shown in the table below.

*Table 2-1 VHF 25–45W Schematic Diagrams and Parts List*

| | |
|---|---|
| **PCB:** | |
| **84012505002-B** Main Board Top Side | Page 2-3 |
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| **SCHEMATICS** | |
| **Overall** | **Page 2-5** |
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# Notes

## 2.0 VHF (136–174 MHz) 25–45W PCB/Schematics/Parts List

*VHF (136–174 MHz) 25–45W 84012505002-B Top Side*

***VHF (136–174 MHz) 25–45W 84012505002-B Bottom Side***

***VHF (136–174 MHz) 25–45W Overall Schematic Diagram***

*VHF (136–174 MHz) 25–45W Receiver Front-End Schematic Diagram*

*VHF (136–174 MHz) 25–45W Transmitter Power Amplifier Schematic Diagram (sheet 1 of 2)*

*VHF (136–174 MHz) 25–45W Transmitter Power Amplifier Schematic Diagram (sheet 2 of 2)*

*VHF (136–174 MHz) 25–45W Transmit/Receive Switch and Harmonic Filter Schematic Diagram*

***VHF (136–174 MHz) 25–45W Power Control Schematic Diagram***

***VHF (136–174 MHz) 25–45W Transmitter Power Amplifier DC Distribution Schematic Diagram***

*VHF (136–174 MHz) 25–45W RFIC Schematic Diagram*

*VHF (136–174 MHz) 25–45W Transmitter VCO Schematic Diagram*

***VHF (136–174 MHz) 25–45W Receiver VCO Schematic Diagram***

***VHF (136–174 MHz) 25–45W VCO Buffer Schematic Diagram***

***VHF PCB 84012505002-B***
***Parts List 25–45W***

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0001M2 | 21667009170 |
| C0002M2 | 21012044001 |
| C0003M2 | NOT PLACED |
| C0004M2 | 21012044001 |
| C0005M2 | 21012044001 |
| C0006M2 | 2113945C31 |
| C0007M2 | 21012044001 |
| C0009M2 | 2113945A10 |
| C0010M2 | 21667009166 |
| C0011M2 | 2113945C31 |
| C0012M2 | 21012044001 |
| C0013M2 | 2113945Y02 |
| C0014M2 | NOT PLACED |
| C0015M2 | 21667009166 |
| C0016M2 | NOT PLACED |
| C0017M2 | 2113945Y02 |
| C0018M2 | 2113946B01 |
| C0019M2 | 2113945Y02 |
| C0020M2 | 21667009166 |
| C0021M2 | 2113945Y02 |
| C0022M2 | NOT PLACED |
| C0023M2 | 2113945A03 |
| C0024M2 | 21012129001 |
| C0025M2 | 2113945A10 |
| C0026M2 | 21667009174 |
| C0027M2 | 2113946B01 |
| C0028M2 | 2113945Y02 |
| C0029M2 | 2113946B01 |
| C0030M2 | 2113946B01 |
| C0031M2 | 2113946B01 |
| C0032M2 | 2113945A10 |
| C0033M2 | 21667009166 |
| C0034M2 | 21012044001 |
| C0035M2 | 2113945A10 |
| C0036M2 | 21667009166 |
| C0037M2 | 2113945A10 |
| C0039M2 | 2113945Y02 |
| C0042M2 | 2113945A03 |
| C0043M2 | 21012044001 |
| C0044M2 | 2113955D45 |
| C0045M2 | 2113945Y02 |
| C0046M2 | 21667009166 |
| C0049M2 | 2113945B02 |
| C0053M2 | 2113945Y02 |
| C0054M2 | 21667009166 |
| C0055M2 | 2113955D37 |
| C0056M2 | 2113945Y02 |
| C0059M2 | 2113945A10 |
| C0060M2 | 21012096001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0061M2 | 2113945Y02 |
| C0064M2 | 21012096001 |
| C0065M2 | 2113945Y02 |
| C0066M2 | 2113945B02 |
| C0067M2 | 2113945Y02 |
| C0068M2 | 2113955D37 |
| C0070M2 | 2113955D37 |
| C0071M2 | 2113955D37 |
| C0072M2 | 2113945A10 |
| C0073M2 | 21667009166 |
| C0074M2 | 21667009166 |
| C0075M2 | 2113946S35 |
| C0076M2 | 2113946S35 |
| C0078M2 | 21667009372 |
| C0080M2 | 2113945B02 |
| C0081M2 | 2113945B02 |
| C0082M2 | 2113945B02 |
| C0083M2 | 2113945B02 |
| C0085M2 | 21667009166 |
| C0086M2 | 2113945C31 |
| C0089M2 | 2113945A10 |
| C0091M2 | 21667009365 |
| C0092M2 | 2113945A10 |
| C0093M2 | NOT PLACED |
| C0094M2 | 2113945Y02 |
| C0095M2 | 2113945A13 |
| C0096M2 | 2113945B02 |
| C0097M2 | 2113945B02 |
| C0098M2 | 21667009166 |
| C0099M2 | 2113945Y02 |
| C0100M2 | 2113945Y02 |
| C0101M2 | 2113945A10 |
| C0102M2 | 2113945A10 |
| C0103M2 | 2113945A10 |
| C0104M2 | 2113945A10 |
| C0105M2 | NOT PLACED |
| C0111M2 | 2113945Y02 |
| C0120M2 | 2113945A10 |
| C0124M2 | 21667009166 |
| C0134M2 | 2113945A10 |
| C0135M2 | 2113945A10 |
| C0136M2 | 2113945A10 |
| C0137M2 | 2113945Y02 |
| C0138M2 | 2113946B01 |
| C0139M2 | NOT PLACED |
| C0140M2 | NOT PLACED |
| C0141M2 | 2113946B01 |
| C0143M2 | 2113945Y02 |
| C0144M2 | 2113945Y02 |
| C0145M2 | 2113945A10 |
| C0146M2 | 2113945A10 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0147M2 | 2113945A10 |
| C0149M2 | 2113945A10 |
| C0150M2 | 2113945A10 |
| C0200M7 | 2113945A10 |
| C0201M7 | 21667009372 |
| C0202M7 | 2113945A06 |
| C0203M7 | 21667009297 |
| C0204M7 | 21667009366 |
| C0205M7 | NOT PLACED |
| C0206M7 | 21667009355 |
| C0207M7 | 21667009355 |
| C0208M7 | 2113945A10 |
| C0212M7 | NOT PLACED |
| C0215M7 | 21667009366 |
| C0216M7 | 21667009315 |
| C0217M7 | 21667009204 |
| C0221M7 | 21667009371 |
| C0222M7 | 21667009374 |
| C0225M7 | 2113945Y02 |
| C0226M7 | 21667009372 |
| C0229M7 | 2113945A10 |
| C0231M7 | 2113945A10 |
| C0233M7 | 21667009284 |
| C0237M7 | 2113945A06 |
| C0238M7 | 2113945Y02 |
| C0239M7 | 2113945Y02 |
| C0240M7 | 2113945A06 |
| C0241M7 | 2113945A06 |
| C0242M7 | 2113945A10 |
| C0243M7 | 2113945A10 |
| C0244M7 | 21667009339 |
| C0245M7 | 21667009339 |
| C0246M7 | 2113945A10 |
| C0247M7 | 2113945A06 |
| C0248M7 | NOT PLACED |
| C0249M7 | 2113945A06 |
| C0252M7 | 21667009294 |
| C0256M7 | 21667009320 |
| C0257M7 | 21667009364 |
| C0259M7 | 2113945Y02 |
| C0263M7 | 2113945A06 |
| C0265M7 | 2113945A06 |
| C0267M7 | 21667009284 |
| C0269M7 | 2113945A10 |
| C0270M7 | 2113945Y02 |
| C0271M7 | 2113945A10 |
| C0276M7 | 21667009371 |
| C0300M7 | 21667009315 |
| C0301M7 | 2113945A06 |
| C0302M7 | 21667009300 |
| C0304M7 | 21667009392 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0305M7 | 2113945Y02 |
| C0306M7 | 2113945A09 |
| C0307M7 | 2113945A02 |
| C0308M7 | NOT PLACED |
| C0309M7 | 21667009368 |
| C0310M7 | NOT PLACED |
| C0311M7 | 21667009371 |
| C0400M4 | NOT PLACED |
| C0401M4 | NOT PLACED |
| C0402M4 | 2113945A10 |
| C0403M4 | 21667009279 |
| C0404M4 | 21667009375 |
| C0405M4 | 21667009279 |
| C0406M4 | 21667009279 |
| C0407M4 | 21667009375 |
| C0408M4 | 2113945C31 |
| C0409M4 | 2113945C31 |
| C0410M4 | 2113945A10 |
| C0411M4 | 2113945A10 |
| C0412M4 | 2113956A51 |
| C0413M4 | 2113945A10 |
| C0414M4 | 21667009388 |
| C0415M4 | 21667009378 |
| C0416M4 | 2113945C31 |
| C0417M4 | 21667009388 |
| C0418M4 | 2113945A10 |
| C0419M4 | NOT PLACED |
| C0420M4 | 2113945A10 |
| C0421M4 | 21667009374 |
| C0422M4 | 2113945A10 |
| C0423M4 | 21667009279 |
| C0424M4 | 21667009374 |
| C0425M4 | 2113945A10 |
| C0427M4 | 2113945A10 |
| C0428M4 | 21667009371 |
| C0429M4 | 21667009386 |
| C0430M4 | 21667009380 |
| C0431M4 | 2113945A10 |
| C0432M4 | 2113945A10 |
| C0433M4 | 2113945A10 |
| C0434M4 | 21667009182 |
| C0435M4 | 21667009370 |
| C0436M4 | 21667009005 |
| C0437M4 | 2113945A10 |
| C0438M4 | 21667009367 |
| C0439M4 | 2113945A10 |
| C0440M4 | 2113945A10 |
| C0441M4 | 21667009367 |
| C0442M4 | NOT PLACED |
| C0452M4 | 21667009374 |
| C0453M4 | 21667009374 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0458M4 | 2113956B54 |
| C0460M4 | 21667009386 |
| C0463M4 | 2113945C31 |
| C0464M4 | 21667009380 |
| C0465M4 | 21667009393 |
| C0466M4 | 2113945A10 |
| C0467M4 | 2113945C31 |
| C0469M4 | 21667009393 |
| C0700M6 | 2113944C85 |
| C0701M6 | 21667009174 |
| C0702M6 | 2113944C83 |
| C0703M6 | 2113944C51 |
| C0704M6 | 21667009125 |
| C0705M6 | 21667009106 |
| C0706M6 | NOT PLACED |
| C0707M6 | 2113945C31 |
| C0708M6 | 2113944C82 |
| C0709M6 | 2113945C04 |
| C0710M6 | 21667009174 |
| C0711M6 | 2113944C85 |
| C0712M6 | 2113945L49 |
| C0713M6 | 21667009174 |
| C0714M6 | 2113944C02 |
| C0715M6 | 21667009164 |
| C0716M6 | 2113944C51 |
| C0717M6 | 21012152001 |
| C0718M6 | 21012094041 |
| C0719M6 | 21667009373 |
| C0720M6 | 2113944C51 |
| C0721M6 | 2113945L37 |
| C0722M6 | 21012152005 |
| C0723M6 | 2171741Y01 |
| C0724M6 | 2113944C46 |
| C0725M6 | 2113944C51 |
| C0726M6 | 2113944C51 |
| C0727M6 | NOT PLACED |
| C0728M6 | 21012094043 |
| C0729M6 | 2113944C51 |
| C0730M6 | 2113945L49 |
| C0731M6 | 21667009174 |
| C0732M6 | 2113945A09 |
| C0733M6 | 2113944C45 |
| C0734M6 | 2113944C51 |
| C0735M6 | 2113944C33 |
| C0736M6 | 21012152001 |
| C0737M6 | 2113944C04 |
| C0738M6 | 2113944C46 |
| C0739M6 | 2113944C84 |
| C0740M6 | 2113945C25 |
| C0741M6 | 2113944C84 |
| C0742M6 | 2113944C30 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0743M6 | 2113944C40 |
| C0744M6 | 2113944C42 |
| C0745M6 | 21009337414 |
| C0746M6 | 21012094044 |
| C0747M6 | NOT PLACED |
| C0748M6 | 2113945C31 |
| C0749M6 | NOT PLACED |
| C0750M6 | 21012094041 |
| C0751M6 | NOT PLACED |
| C0752M6 | NOT PLACED |
| C0753M6 | 2113944C51 |
| C0754M6 | 2113944C45 |
| C0755M6 | 2113944C36 |
| C0756M6 | 21012094042 |
| C0757M6 | 21012094039 |
| C0758M6 | 21012152001 |
| C0759M6 | 21012152001 |
| C0760M6 | 2113944C79 |
| C0761M6 | 2113944C45 |
| C0762M6 | 21012152001 |
| C0763M6 | 21012094043 |
| C0764M6 | 2113944C51 |
| C0765M6 | 21012152001 |
| C0766M6 | 21012152005 |
| C0767M6 | NOT PLACED |
| C0768M6 | 21012094057 |
| C0769M6 | 21012094046 |
| C0770M6 | 21012152001 |
| C0771M6 | NOT PLACED |
| C0772M6 | 2113945C31 |
| C0773M6 | 21012094043 |
| C0774M6 | 21012094047 |
| C0775M6 | 2113944C06 |
| C0776M6 | 2113945A09 |
| C0777M6 | NOT PLACED |
| C0779M6 | 21012094057 |
| C0780M6 | 21012094046 |
| C0781M6 | 21012094046 |
| C0782M6 | 21012094043 |
| C0783M6 | NOT PLACED |
| C0784M6 | 21012094061 |
| C0785M6 | 21012152001 |
| C0786M6 | 21012152001 |
| C0787M6 | NOT PLACED |
| C0788M6 | 21012094041 |
| C0789M6 | 21012094039 |
| C0790M6 | 21012094046 |
| C0791M6 | 21012094046 |
| C0792M6 | 21012094047 |
| C0793M6 | 2113944C84 |
| C0794M6 | 2113944C02 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0795M6 | 21012094057 |
| C0796M6 | 2113944C31 |
| C0797M6 | 2113944C31 |
| C0798M6 | 2113944C31 |
| C0799M6 | 2113944C31 |
| C0800M6 | NOT PLACED |
| C0801M6 | 21012094047 |
| C0802M6 | 21012094057 |
| C0803M6 | 21012094046 |
| C0804M6 | 21012094047 |
| C0805M6 | NOT PLACED |
| C0806M6 | 21012094043 |
| C0807M6 | 21012094057 |
| C0808M6 | 21012094044 |
| C0809M6 | 21012152005 |
| C0810M6 | 21012152001 |
| C0811M6 | 21012152001 |
| C0812M6 | NOT PLACED |
| C0813M6 | 21012152001 |
| C0814M6 | NOT PLACED |
| C0815M6 | 21012094057 |
| C0816M6 | 21012152001 |
| C0817M6 | 21012094052 |
| C0818M6 | 2113944C02 |
| C0819M6 | 21012094057 |
| C0820M6 | 21012094057 |
| C0821M6 | 21012094045 |
| C0822M6 | 21012094041 |
| C0823M6 | 21012094041 |
| C0824M6 | 21012152001 |
| C0825M6 | NOT PLACED |
| C0826M6 | 21012094033 |
| C0827M6 | 21012094061 |
| C0828M6 | NOT PLACED |
| C0829M6 | 2113944C84 |
| C0830M6 | 2113944C42 |
| C0831M6 | 2113944C02 |
| C0832M6 | 2113944C02 |
| C0833M6 | 2113944C40 |
| C0834M6 | 2113944C31 |
| C0835M6 | 2113944C31 |
| C0836M6 | 2113944C31 |
| C0837M6 | 2113944C31 |
| C0838M6 | 21012094061 |
| C0839M6 | 21012152001 |
| C0840M6 | 21012094044 |
| C0841M6 | 21012094041 |
| C0842M6 | NOT PLACED |
| C0843M6 | 21012094043 |
| C0844M6 | NOT PLACED |
| C0845M6 | 21012152001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0846M6 | 21012152005 |
| C0847M6 | NOT PLACED |
| C0848M6 | 21012094046 |
| C0850M6 | 21012152001 |
| C0851M6 | 21012094057 |
| C0852M6 | 21012094039 |
| C0853M6 | 21012094041 |
| C0854M6 | 21012094039 |
| C0855M6 | 21012094039 |
| C0856M6 | 21012094061 |
| C0857M6 | 21012094046 |
| C0858M6 | 21012094046 |
| C0859M6 | 21012094046 |
| C0860M6 | 21012094045 |
| C0861M6 | 21012094045 |
| C0862M6 | 21012094056 |
| C0863M6 | 21012094056 |
| C0864M6 | 21012094056 |
| C0865M6 | 21012094056 |
| C0866M6 | 21012094046 |
| C0867M6 | NOT PLACED |
| C0868M6 | 21012094056 |
| C0869M6 | 21012094056 |
| C0870M6 | 21012094043 |
| C0872M6 | NOT PLACED |
| C0873M6 | NOT PLACED |
| C0874M6 | 21012094056 |
| C0875M6 | 2113944C06 |
| C0876M6 | 2113944C31 |
| C0877M6 | 2113944C06 |
| C0878M6 | 21012094046 |
| C0879M6 | 2113944C06 |
| C0880M6 | 2113944C35 |
| C0881M6 | 21012152001 |
| C0882M6 | 21012094052 |
| C0883M6 | 21012094052 |
| C0884M6 | 2113944C06 |
| C0885M6 | 2113944C51 |
| C0886M6 | 21012094046 |
| C0887M6 | 21012094046 |
| C0888M6 | 21012094046 |
| C0889M6 | 21012094046 |
| C0890M6 | 21012094056 |
| C0891M6 | 21012094046 |
| C0892M6 | 21012094046 |
| C0893M6 | 21012094056 |
| C0894M6 | 21012094056 |
| C0895M6 | 21012094056 |
| C0896M6 | 21012094056 |
| C0897M6 | 21012094056 |
| C0898M6 | 21012094056 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C0899M6 | NOT PLACED |
| C0900M6 | NOT PLACED |
| C0901M6 | NOT PLACED |
| C0902M6 | 2113944C51 |
| C0903M6 | 21012094056 |
| C0904M6 | 21012094056 |
| C0905M6 | 2113945C31 |
| C0906M6 | 2113945A10 |
| C0907M6 | 2113945L41 |
| C0908M6 | 21667009174 |
| C0909M6 | NOT PLACED |
| C0910M6 | NOT PLACED |
| C0911M6 | 2113944C02 |
| C0912M6 | NOT PLACED |
| C0913M6 | 21667009174 |
| C0914M6 | 21012094056 |
| C0915M6 | 21012094056 |
| C0916M6 | NOT PLACED |
| C0917M6 | 21667009174 |
| C0918M6 | 21667009174 |
| C0919M6 | 21667009174 |
| C0920M6 | 21012094056 |
| C0921M6 | 2113944C51 |
| C0922M6 | NOT PLACED |
| C0923M6 | NOT PLACED |
| C0924M6 | NOT PLACED |
| C0925M6 | 2113946B04 |
| C0926M6 | 2113944C02 |
| C0927M6 | 21012094056 |
| C0928M6 | 21012094041 |
| C0929M6 | 21012094041 |
| C0930M6 | NOT PLACED |
| C0931M6 | 21012094056 |
| C0932M6 | NOT PLACED |
| C0933M6 | NOT PLACED |
| C0934M6 | NOT PLACED |
| C0936M6 | NOT PLACED |
| C0937M6 | 21012094056 |
| C0938M6 | NOT PLACED |
| C0939M6 | NOT PLACED |
| C0940M6 | NOT PLACED |
| C0941M6 | NOT PLACED |
| C0942M6 | NOT PLACED |
| C0950M6 | 2113944C51 |
| C0951M6 | 2113944C30 |
| C0952M6 | 2113944C51 |
| C0953M6 | 2113944C51 |
| C0954M6 | 2113944C81 |
| C0955M6 | 2113944C51 |
| C0956M6 | 2113944C01 |
| C0957M6 | 21667009172 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| C3000M6 | 2113944C38 |
| C3001M6 | 2113944C06 |
| C3002M6 | 2113944C06 |
| C3003M6 | 2113945C31 |
| C3004M6 | 2113945C02 |
| C3005M6 | 2113945C02 |
| C3008M6 | 2113944C51 |
| C3009M6 | 2113945C31 |
| C3010M6 | 2113944C46 |
| C3011M6 | 2113945G53 |
| C3012M6 | 2113946J04 |
| C3013M6 | 2113945C31 |
| C3014M6 | 21009337414 |
| C3015M6 | 2113946G01 |
| C3016M6 | 2113945C31 |
| C3019M6 | NOT PLACED |
| C3020M6 | 2113945C26 |
| C3021M6 | 2113944C06 |
| C3022M6 | 2113945A10 |
| C3029M6 | NOT PLACED |
| C3038M6 | 21667009169 |
| C3041M6 | 21667009169 |
| C3042M6 | 21667009169 |
| C3044M6 | 21667009169 |
| C3046M6 | 21667009174 |
| C3047M6 | 21667009174 |
| C3048M6 | 21667009174 |
| C3049M6 | 21667009174 |
| C3050M6 | 21667009169 |
| C3051M6 | 21667009174 |
| D0000M2 | 4815011H01 |
| D0001M2 | 4815011H01 |
| D0401M4 | 4813974A19 |
| D0402M4 | 4813974A19 |
| D0700M6 | 48012160001 |
| D0875M6 | NOT PLACED |
| D0876M6 | 4886622Y06 |
| D0877M6 | 48012160001 |
| D0950M6 | 4813974A21 |
| D0951M6 | 4813974A21 |
| D0960M6 | NOT PLACED |
| D3000M6 | 4813978P07 |
| E0000M2 | 24012107027 |
| E0001M2 | 24012107027 |
| E0004M2 | 24012107027 |
| E0005M2 | 24012107027 |
| E0006M2 | 24012107027 |
| E0007M2 | 24012107027 |
| E0008M2 | 24012107027 |
| E0009M2 | 24012107027 |
| E0010M2 | 24012107027 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| E0300M7 | 24012107027 |
| E0301M7 | 24012107027 |
| E0400M4 | 2471132D16 |
| E0401M4 | 2471132D16 |
| E0402M4 | 2471132D16 |
| E0403M4 | 24012107027 |
| E0404M4 | 2471132D16 |
| E0405M4 | 2471132D16 |
| E0700M6 | 24012102001 |
| E0701M6 | 24012102001 |
| E0703M6 | 24012102001 |
| E3000M6 | 24012102001 |
| J0700M6 | 09009348001 |
| L0000M2 | 24012161001 |
| L0001M2 | 24667008014 |
| L0200M7 | 24667000031 |
| L0201M7 | 24667008024 |
| L0202M7 | 24667008013 |
| L0204M7 | 24667005040 |
| L0205M7 | 24667008018 |
| L0206M7 | 24667005040 |
| L0208M7 | 24667000031 |
| L0210M7 | 24009342045 |
| L0211M7 | 2414015C11 |
| L0212M7 | 24667008032 |
| L0214M7 | 24009343013 |
| L0216M7 | 24009343007 |
| L0218M7 | 24667008032 |
| L0220M7 | 24667008032 |
| L0222M7 | 24667008032 |
| L0224M7 | 24667008032 |
| L0226M7 | 24667008017 |
| L0300M7 | 24667008017 |
| L0301M7 | 24667008032 |
| L0302M7 | 24667008032 |
| L0303M7 | 24667008013 |
| L0304M7 | 24667008019 |
| L0305M7 | 24667008016 |
| L0400M4 | 24667008018 |
| L0401M4 | 2414015C09 |
| L0402M4 | 2475122C33 |
| L0403M4 | 24667005043 |
| L0404M4 | 24667005043 |
| L0405M4 | 24009344125 |
| L0406M4 | 2414015C09 |
| L0407M4 | 24667008025 |
| L0408M4 | 24009344035 |
| L0409M4 | 24667008025 |
| L0410M4 | 24667008018 |
| L0413M4 | 2475122C42 |
| L0414M4 | 2475122C42 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| L0700M6 | 24667008024 |
| L0701M6 | 24667008020 |
| L0702M6 | 24667008028 |
| L0703M6 | 24667008020 |
| L0704M6 | 24667008028 |
| L0705M6 | 24667008020 |
| L0706M6 | 24012145001 |
| L0707M6 | 24667008031 |
| L0708M6 | 2460591A01 |
| L0709M6 | 24667008019 |
| L0710M6 | 2460591C53 |
| L0711M6 | 24012145004 |
| L0712M6 | 2460591A77 |
| L0716M6 | 24667008016 |
| L0717M6 | 24667008016 |
| L0718M6 | 24667008018 |
| L0719M6 | 24667008025 |
| L0727M6 | 2415385H07 |
| L0729M6 | 2414032B60 |
| L0730M6 | 24667008021 |
| L0849M6 | 24667008014 |
| L0852M6 | 24012145004 |
| L0854M6 | 24012145004 |
| L0857M6 | 2415385H02 |
| L0875M6 | 24012145004 |
| L0876M6 | 24667008031 |
| L0877M6 | 24009343030 |
| L0880M6 | 24009343030 |
| L0885M6 | 2414032B49 |
| L0899M6 | 2416077H16 |
| L0900M6 | NOT PLACED |
| L0901M6 | NOT PLACED |
| L0902M6 | NOT PLACED |
| L0950M6 | 0613952G67 |
| L0951M6 | NOT PLACED |
| L0952M6 | NOT PLACED |
| M0700M6 | 2686201B02 |
| M3000M6 | 0289511U04 |
| P3000M6 | NOT PLACED |
| Q0000M2 | 4813973A13 |
| Q0001M2 | 4816134H01 |
| Q0002M2 | 4813970A59 |
| Q0200M7 | 48012195001 |
| Q0203M7 | 4815272H01 |
| Q0204M7 | 48012195001 |
| Q0205M7 | 4816134H01 |
| Q0206M7 | 4815272H01 |
| Q0207M7 | 4816134H01 |
| Q0300M7 | 4802197J95 |
| Q0400M4 | 4815270H01 |
| Q0401M4 | 4815267H01 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| Q0402M4 | 48012201001 |
| Q0403M4 | NOT PLACED |
| Q0404M4 | 4816134H01 |
| Q0405M4 | 4816134H01 |
| Q0406M4 | 4815066H01 |
| Q0407M4 | 4815272H01 |
| Q0700M6 | 4816547H01 |
| Q0701M6 | 4816013H01 |
| Q0702M6 | 48012022001 |
| Q0703M6 | 4802246J29 |
| Q0704M6 | 4816548H01 |
| Q0875M6 | 4813970A62 |
| Q0876M6 | 4816134H01 |
| Q0900M6 | NOT PLACED |
| Q3000M6 | 0105959T72 |
| Q3001M6 | 0105959T72 |
| Q3002M6 | 4813973B01 |
| R0000M2 | 0613952R66 |
| R0001M2 | 0613952R66 |
| R0006M2 | 0613952Q25 |
| R0007M2 | 0613952Q46 |
| R0008M2 | 0613952R01 |
| R0009M2 | 0613952Q51 |
| R0010M2 | 0613952R66 |
| R0011M2 | 0613952Q35 |
| R0012M2 | 0613952Q81 |
| R0013M2 | 0613952Q35 |
| R0014M2 | 0613952R66 |
| R0015M2 | 0613952R66 |
| R0019M2 | 0613952R01 |
| R0022M2 | 0613952R66 |
| R0025M2 | 0613952R66 |
| R0029M2 | 0613952Q25 |
| R0030M2 | 0613952R66 |
| R0044M2 | 0613952R25 |
| R0054M2 | 0613952M25 |
| R0200M7 | 0613952R66 |
| R0202M7 | 0613952Q42 |
| R0203M7 | 0613952Q32 |
| R0204M7 | NOT PLACED |
| R0205M7 | 0613952H37 |
| R0206M7 | NOT PLACED |
| R0207M7 | 0613952Q86 |
| R0208M7 | 0613952G67 |
| R0209M7 | 0613952Q85 |
| R0211M7 | 0613952Q18 |
| R0213M7 | 0613952Q67 |
| R0215M7 | 0613952Q67 |
| R0217M7 | 0613952Q49 |
| R0220M7 | 0613952R66 |
| R0221M7 | 0613952R66 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0222M7 | 0613952Q78 |
| R0223M7 | 0613952Q73 |
| R0224M7 | 0613952Q73 |
| R0225M7 | 0613952Q73 |
| R0226M7 | NOT PLACED |
| R0227M7 | 0613952G67 |
| R0228M7 | 0613952Q67 |
| R0230M7 | 0613952Q67 |
| R0232M7 | 0613952Q49 |
| R0233M7 | 0613952R66 |
| R0300M7 | 0613952Q66 |
| R0301M7 | 0613952Q25 |
| R0302M7 | 0613952Q66 |
| R0303M7 | 0613952Q94 |
| R0304M7 | 0613952Q89 |
| R0305M7 | 0613952Q33 |
| R0306M7 | 0613952Q49 |
| R0307M7 | 0613952H46 |
| R0308M7 | 0613952Q49 |
| R0309M7 | 0613952Q42 |
| R0400M4 | 0613952Q38 |
| R0401M4 | 0613958H68 |
| R0402M4 | 0613952R25 |
| R0403M4 | 0613952R01 |
| R0404M4 | 0613952R25 |
| R0405M4 | 0613952Q72 |
| R0406M4 | 0613952Z43 |
| R0407M4 | 0613952Q73 |
| R0408M4 | 0613952Q88 |
| R0409M4 | NOT PLACED |
| R0410M4 | 0613952R01 |
| R0411M4 | 0613952Q69 |
| R0412M4 | 0613952Q67 |
| R0413M4 | 0613952Q75 |
| R0414M4 | 0613958H69 |
| R0415M4 | 0613952Q69 |
| R0416M4 | 0613952R25 |
| R0417M4 | 0613952Q69 |
| R0418M4 | 0613952H73 |
| R0419M4 | 0613952Q53 |
| R0420M4 | 0613952H73 |
| R0421M4 | 0613952Q69 |
| R0422M4 | 0613952Q53 |
| R0423M4 | 0613952Q77 |
| R0424M4 | 0613952Q77 |
| R0425M4 | 0613952N37 |
| R0426M4 | 0613958H69 |
| R0427M4 | 0613952N01 |
| R0428M4 | NOT PLACED |
| R0429M4 | 0613952R66 |
| R0430M4 | 0613952N46 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0431M4 | 0613952Z48 |
| R0432M4 | 0613952Q67 |
| R0433M4 | NOT PLACED |
| R0434M4 | 0613952Q23 |
| R0435M4 | 0613952Q67 |
| R0436M4 | 0613952R66 |
| R0437M4 | NOT PLACED |
| R0438M4 | 0613952R66 |
| R0439M4 | NOT PLACED |
| R0440M4 | 0613952L46 |
| R0441M4 | NOT PLACED |
| R0442M4 | 0613952K25 |
| R0443M4 | 0613952L46 |
| R0444M4 | 0613952Q78 |
| R0445M4 | 0613952Q46 |
| R0448M4 | 0613952Q35 |
| R0700M6 | 0613952J01 |
| R0701M6 | 0613952G67 |
| R0702M6 | 0613952H49 |
| R0703M6 | 0613952J01 |
| R0704M6 | 0613952J01 |
| R0705M6 | 0613952H48 |
| R0706M6 | 0613952H47 |
| R0707M6 | 0613952H48 |
| R0708M6 | NOT PLACED |
| R0709M6 | NOT PLACED |
| R0710M6 | NOT PLACED |
| R0711M6 | 0613958S44 |
| R0712M6 | 0613958S44 |
| R0713M6 | NOT PLACED |
| R0714M6 | 0613952H35 |
| R0715M6 | 0613952H35 |
| R0716M6 | 0613952H35 |
| R0717M6 | 0613952H35 |
| R0718M6 | 0613952H96 |
| R0719M6 | 0613952H89 |
| R0720M6 | 0613952J01 |
| R0721M6 | 0613952G67 |
| R0722M6 | 0613952H25 |
| R0723M6 | 0613952G67 |
| R0724M6 | 0613959Q53 |
| R0725M6 | 0613958S29 |
| R0726M6 | 0613958S29 |
| R0727M6 | 0613958S29 |
| R0728M6 | 0613958S29 |
| R0729M6 | 0613958S29 |
| R0730M6 | 0613958S29 |
| R0731M6 | 0613958S29 |
| R0732M6 | 0613958S29 |
| R0733M6 | 0613958S29 |
| R0734M6 | 0613958S29 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0735M6 | 0613958S29 |
| R0736M6 | 0613959Q25 |
| R0737M6 | 0613952F01 |
| R0738M6 | 0613958S29 |
| R0739M6 | 0613952H73 |
| R0740M6 | 0613952H73 |
| R0741M6 | 0613952E66 |
| R0742M6 | 0613952H73 |
| R0743M6 | 0613952E66 |
| R0744M6 | NOT PLACED |
| R0745M6 | NOT PLACED |
| R0746M6 | 0613952F01 |
| R0748M6 | NOT PLACED |
| R0749M6 | 0613952N43 |
| R0755M6 | 0613958J74 |
| R0758M6 | 0613952R01 |
| R0759M6 | 0613959H12 |
| R0760M6 | NOT PLACED |
| R0763M6 | NOT PLACED |
| R0764M6 | 0613958J74 |
| R0765M6 | 0613958J74 |
| R0766M6 | 0613952R01 |
| R0767M6 | 0613952R01 |
| R0768M6 | 0613952R01 |
| R0769M6 | 0613952R01 |
| R0770M6 | 0613952R01 |
| R0771M6 | 0613952R01 |
| R0772M6 | 0613952R01 |
| R0773M6 | 0613952R01 |
| R0774M6 | 0613952R01 |
| R0775M6 | 0613952R01 |
| R0776M6 | 0613952R01 |
| R0777M6 | 0613952R01 |
| R0778M6 | 0613952R01 |
| R0779M6 | 0613952R01 |
| R0780M6 | 0613952R01 |
| R0781M6 | 0613952R01 |
| R0782M6 | 0613952R01 |
| R0783M6 | 0613952R01 |
| R0784M6 | 0613952R01 |
| R0785M6 | 0613952R01 |
| R0786M6 | 0613952R01 |
| R0787M6 | 0613952R01 |
| R0788M6 | 0613952R01 |
| R0789M6 | 0613952R01 |
| R0790M6 | 0613952R01 |
| R0791M6 | NOT PLACED |
| R0792M6 | 0613952R01 |
| R0793M6 | 0613952R01 |
| R0794M6 | 0613952R01 |
| R0795M6 | 0613952R01 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0796M6 | 0613952R01 |
| R0797M6 | 0613952R01 |
| R0798M6 | NOT PLACED |
| R0799M6 | 0613952R01 |
| R0800M6 | 0613952R01 |
| R0801M6 | 0613952R01 |
| R0802M6 | 0613952R01 |
| R0803M6 | 0613952R01 |
| R0804M6 | 0613952R01 |
| R0805M6 | NOT PLACED |
| R0806M6 | NOT PLACED |
| R0807M6 | NOT PLACED |
| R0808M6 | NOT PLACED |
| R0809M6 | NOT PLACED |
| R0810M6 | 0613952R01 |
| R0811M6 | 0613952R01 |
| R0812M6 | NOT PLACED |
| R0813M6 | 0613952R66 |
| R0876M6 | 0613958S73 |
| R0877M6 | 0613959Y37 |
| R0878M6 | 0613959Y37 |
| R0879M6 | 0613952J25 |
| R0882M6 | 0613952G67 |
| R0883M6 | 0613952G67 |
| R0902M6 | 0613952R66 |
| R0903M6 | 0613952N01 |
| R0904M6 | 0613952R66 |
| R0905M6 | 0613952H42 |
| R0906M6 | 0613958H46 |
| R0907M6 | 0613958H55 |
| R0908M6 | NOT PLACED |
| R0909M6 | NOT PLACED |
| R0910M6 | NOT PLACED |
| R0911M6 | NOT PLACED |
| R0912M6 | 0613958H46 |
| R0913M6 | 0613952M51 |
| R0914M6 | 0613952M71 |
| R0915M6 | NOT PLACED |
| R0916M6 | 0613952R66 |
| R0917M6 | 0613952P01 |
| R0919M6 | 0613952P01 |
| R0920M6 | 0613952N01 |
| R0921M6 | 0613952N01 |
| R0922M6 | 0613952R66 |
| R0923M6 | 0613952M43 |
| R0924M6 | 0613952N09 |
| R0928M6 | 0613952P30 |
| R0929M6 | 0613952N81 |
| R0930M6 | 0613952N51 |
| R0931M6 | 0613952Z26 |
| R0932M6 | 0613952Z60 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| R0933M6 | 0613952Z50 |
| R0934M6 | 0613952J17 |
| R0935M6 | 0613952H91 |
| R0936M6 | NOT PLACED |
| R0937M6 | NOT PLACED |
| R0938M6 | NOT PLACED |
| R0939M6 | 0613952R66 |
| R0940M6 | 0613952Z76 |
| R0950M6 | 0613952G67 |
| R0951M6 | 0613958H55 |
| R0952M6 | 0613958H53 |
| R0953M6 | 0613952G67 |
| R0954M6 | 0613952H39 |
| R0955M6 | 0613952H39 |
| R0956M6 | 0613952G67 |
| R0957M6 | 0613958H53 |
| R0958M6 | 0613958H53 |
| R0959M6 | 0613952R66 |
| R0960M6 | 0613952N58 |
| R0961M6 | 0613952N58 |
| R0962M6 | 0613952N58 |
| R0965M6 | 0613952P01 |
| R3000M6 | 0613952H60 |
| R3001M6 | 0615871H01 |
| R3002M6 | 0615871H01 |
| R3003M6 | 0615871H01 |
| R3004M6 | 0615871H01 |
| R3005M6 | 0613952H25 |
| R3006M6 | 0613952H25 |
| R3007M6 | 0613952M30 |
| R3008M6 | 0613952G67 |
| R3009M6 | 0613952M43 |
| R3010M6 | 0613952G67 |
| R3011M6 | 0613959Q60 |
| R3012M6 | 0613959Q60 |
| R3013M6 | 0613952R01 |
| R3014M6 | 0613952R01 |
| R3015M6 | 0615871H01 |
| R3018M6 | 0613952H73 |
| R3019M6 | 0613952H60 |
| R3020M6 | 0613952G67 |
| R3021M6 | 0613952R25 |
| RT0900M6 | 0615585H01 |
| SH0000M2 | 26012095001 |
| SH0001M2 | 26012095001 |
| SH0003M2 | 26012094001 |
| SH0200M7 | 26012231001 |
| SH0201M7 | 26012231001 |
| SH0400M4 | 26012231001 |
| SH0401M4 | 26012231001 |
| SH0700M6 | 26012100001 |

| Circuit Ref. | Motorola Part No. |
|---|---|
| SH0900M6 | 2686425Z02 |
| SH0901M6 | 2686425Z02 |
| T0000M2 | 25012016001 |
| U0000M2 | 51009686002 |
| U0200M7 | 5186310Y39 |
| U0400M4 | 5180390L83 |
| U0401M4 | 5186310Y39 |
| U0402M4 | 5186310Y39 |
| U0901M6 | 5180390L83 |
| U0902M6 | 51012221001 |
| U0903M6 | 5115022H01 |
| U0904M6 | 5109731C48 |
| U3000M6 | 5116525H01 |
| U3001M6 | 4813973M07 |
| U3002M6 | NOT PLACED |
| VR0200M7 | 48012260001 |
| VR0201M7 | 4805656W87 |
| VR0205M7 | 4805656W87 |
| VR0206M7 | 48012260001 |
| VR0210M7 | 4805656W87 |
| VR0211M7 | 4805656W87 |
| VR0214M7 | 4805656W87 |
| VR0215M7 | 4805656W87 |
| VR0400M4 | 4805656W87 |
| VR0401M4 | 4805656W87 |
| VR0402M4 | 4805656W87 |
| VR0403M4 | 4805656W87 |
| VR3000M6 | 48012202001 |
| VR3002M6 | 4813977M10 |
| Y0000M2 | 4875185M05 |

Note: The suffix “M1”, “M2”, etc. from the Circuit Ref is removed from the schematic and overlays.

## Notes

# Appendix A Replacement Parts and Kits

## A.1 Level 1 and 2 Maintenance

This manual covers Level 1 and 2 Maintenance:

Level 1 maintenance is the assessment and/or repair of fault in terms of faulty accessory or physical aspect of product; not including opening of the unit. Limited to replacement of antenna, battery, handset, external microphones, external knobs, all related frequency programming to customers' and in some cases alignment/tuning, by Customer Programming software (CPS).

Level 2 maintenance includes all Level I activities plus: Assessment that require opening the Subscriber Product and rectifying a fault by replacement of a board or module, or replacement of major mechanical parts (like Front Housing Kit or Control Head Board), followed by alignment/tuning to ensure the replacement of board/module/major mechanical parts are within Subscriber Product's specifications as per the service manual. It does not incorporate discrete component replacement.

### A.1.1 Replacement Parts Ordering

Some replacement parts, spare parts, and/or product information can be ordered directly. While parts may be assigned with a Motorola part number, this does not guarantee that they are available from Motorola Radio Products and Solutions Organization (RPSO). If no Motorola part number is assigned, the part is normally not available from Motorola, or is not a user-serviceable part. Part numbers appended with an asterisk are serviceable by Motorola Depot only.

Orders for replacement parts, kits, and assemblies should be placed directly on Motorola's local distribution organization or via Motorola Online. For Level 2 maintenance, only Motorola Service Centers or Authorized Motorola Service Dealers can perform these functions. Any tampering by non-authorized Motorola Service Centers voids the warranty of your radio. To find out more about Motorola Service Centers, please visit http://www.motorolasolutions.com

## A.2 Level 3 Maintenance

The Level 3 Maintenance can only be done at the Motorola Service Center/Depot since it can deeply affect the performance of the radio. To find out more about Motorola Service Center, please visit http://www.motorolasolutions.com

# Notes

# Glossary

This glossary contains an alphabetical listing of terms and their definitions that are applicable to portable and mobile subscriber radio products. All terms do not necessarily apply to all radios, and some terms are merely generic in nature.

| Term | Definition |
|---|---|
| **Analogue** | Refers to a continuously variable signal or a circuit or device designed to handle such signals. |
| **Band** | Frequencies allowed for a specific purpose. |
| **CMOS** | Complementary Metal Oxide Semiconductor. |
| **CPS** | Customer Programming Software: Software with a graphical user interface containing the feature set of a radio. |
| **Default** | A pre-defined set of parameters. |
| **Digital** | Refers to data that is stored or transmitted as a sequence of discrete symbols from a finite set; most commonly this means binary data represented using electronic or electromagnetic signals. |
| **DPL** | Digital Private-Line: A type of digital communications that utilizes privacy call, as well as memory channel and busy channel lock out to enhance communication efficiency. |
| **FCC** | Federal Communications Commission. |
| **Frequency** | Number of times a complete electromagnetic-wave cycle occurs in a fixed unit of time (usually one second). |
| **GPIO** | General-Purpose Input/Output. |
| **GPS** | Global Positioning System. |
| **IC** | Integrated Circuit: An assembly of interconnected components on a small semiconductor chip, usually made of silicon. One chip can contain millions of microscopic components and perform many functions. |
| **IF** | Intermediate Frequency. |
| **kHz** | kilohertz: One thousand cycles per second. Used especially as a radio frequency unit. |
| **LCD** | Liquid-Crystal Display: An LCD uses two sheets of polarizing material with a liquid-crystal solution between them. An electric current passed through the liquid causes the crystals to align so that light cannot pass through them. |
| **LDMOS** | Laterally Diffused Metal Oxide Semiconductor. |
| **LED** | Light Emitting Diode: An electronic device that lights up when electricity is passed through it. |
| **MDC** | Motorola Digital Communications. |

| Term | Definition |
|---|---|
| **MHz** | Megahertz: One million cycles per second. Used especially as a radio frequency unit. |
| **Paging** | One-way communication that alerts the receiver to retrieve a message. |
| **PC Board** | Printed Circuit Board. Also referred to as a PCB. |
| **PL** | Private-Line Tone Squelch: A continuous sub-audible tone that is transmitted along with the carrier. |
| **Programming Cable** | A cable that allows the CPS to communicate directly with the radio using USB. |
| **Receiver** | Electronic device that amplifies RF signals. A receiver separates the audio signal from the RF carrier, amplifies it, and converts it back to the original sound waves. |
| **Repeater** | Remote transmit/receive facility that re-transmits received signals in order to improve communications range and coverage (conventional operation). |
| **RF** | Radio Frequency: The portion of the electromagnetic spectrum between audio sound and infrared light (approximately 10 kHz to 10 GHz). |
| **RX** | Receive. |
| **Signal** | An electrically transmitted electromagnetic wave. |
| **Spectrum** | Frequency range within which radiation has specific characteristics. |
| **Squelch** | Muting of audio circuits when received signal levels fall below a pre-determined value. With carrier squelch, all channel activity that exceeds the radio's preset squelch level can be heard. |
| **TOT** | Time-out Timer: A timer that limits the length of a transmission. |
| **TPL** | Tone Private Line. |
| **Transceiver** | Transmitter-receiver. A device that both transmits and receives analogue or digital signals. Also abbreviated as XCVR. |
| **Transmitter** | Electronic equipment that generates and amplifies an RF carrier signal, modulates the signal, and then radiates it into space. |
| **TX** | Transmit. |
| **UHF** | Ultra-High Frequency. |
| **USB** | Universal Serial Bus: An external bus standard that supports data transfer rates of 12 Mbps. |
| **VHF** | Very High Frequency. |
| **VIP** | Vehicle Interface Port. |
| **XiR** | Refers to Digital Professional Radio model names in the MOTOTRBO Professional Digital Two-Way Radio System. |

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